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AT&T moves to safeguard 800 users

By Bob Wallace
Senior Editor

BASKING RIDGE, N.J. — AT&T last week laid out plans to fortify its 800 service to shield customers from outages such as the nine-hour crash that crippled its network last January.

The carrier said the move is part of an ongoing effort to provide users with the highest call completion rates and most advanced 800 service features in the industry.

The AT&T program provides for everything from alternate path routing to new switch-based call routing features and a separate signaling network dedicated to 800 service usage.

"AT&T has to increase its network reliability and give 800 customers 100% assurances that outages like the one in January won't happen again, even if it means doing things as expensive as hanging onto [its old] CCS6 signaling network," said Steve Sazegari, a senior industry analyst with Dataquest, Inc., a San Jose, Calif.-based consultancy.

The planned changes include:

- **Alternate routing paths.** AT&T is installing digital trunks in the top 20 to 25 local access and transport areas that are dedicated to carrying 800 calls be-

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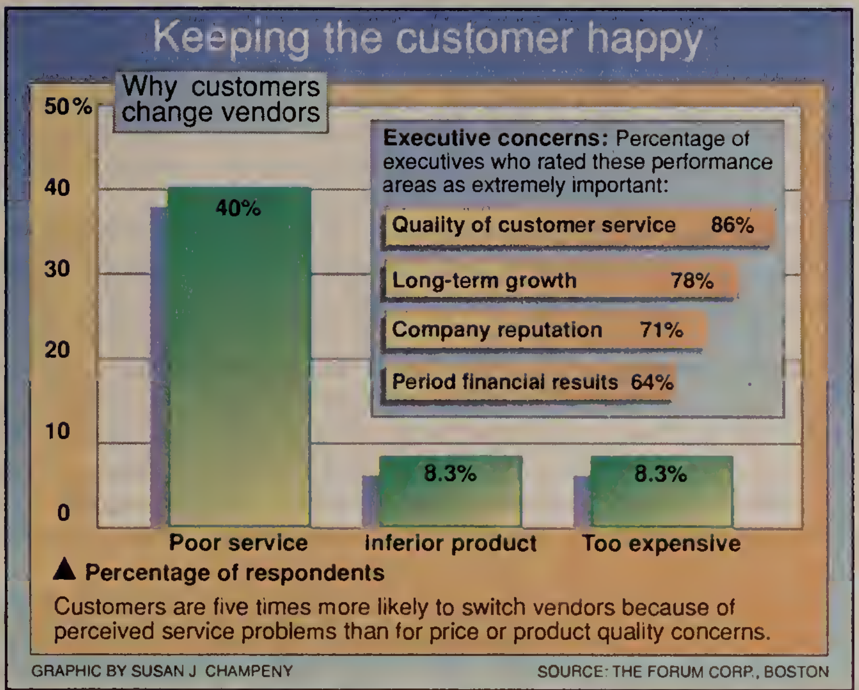

Customers are five times more likely to switch vendors because of perceived service problems than for price or product quality concerns.

GRAPHIC BY SUSAN J CHAMPENY

SOURCE: THE FORUM CORP., BOSTON

Networks are heavy armor in customer service wars

Companies look to net-based applications, links to customers to win loyalty, gain edge on rivals.

By Barton Crockett and Bob Brown
Network World Staff

As companies focus on customer service as a way to differentiate their products in increasingly crowded markets, a growing number of them are turning to their networks for help.

Networks are being used to expedite service requests, forge closer relationships with customers and improve product performance.

"In general, business has become too impersonal, largely because computers and networks were installed with only saving money and doing business faster in mind," said John LeSueur, corporate manager of telecommunications for Sherwin-Williams Co. "The pendulum is starting to swing back the other way, and network managers are being asked to focus more on customer service."

Research shows that customer service is a key factor in building loyalty. In a recent study by The Forum Corp., a Boston-based consultancy, 86% of the 611 executives surveyed last year said

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Lotus/Novell merger surprises LAN users

Market leaders combine in powerful applications, networking company; Novell will be unit of Lotus.

By Bob Brown
Senior Editor

CAMBRIDGE, Mass. — Lotus Development Corp. and Novell, Inc. last week shocked the network industry when they announced plans to merge by way of a stock swap valued at about $1.5 billion.

Under the letter of intent signed by the two companies, Novell will become a wholly owned subsidiary of Lotus, which will issue about 41.6 million new shares to Novell stockholders.

The merger, which stunned customers of both vendors, will result in a company with combined revenues approaching $1 billion. In 1989, Lotus' revenue was $556 million, while Novell posted revenue of $422 million.

The agreement will enable Lotus, which has expertise in application software, and Novell, which specializes in network software, to compete more effectively with Microsoft Corp., an $804 million company emerging as a strong competitor in both markets.

Application expertise will become increasingly important to Novell as more users choose their applications before their network operating systems, analysts said.

In data base management, for example, Novell's products have paled in comparison to those from Microsoft. As a Lotus subsidiary, Novell will be able to take

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Appeals court reverses Greene ruling on information services. Story page 2.

Consent Decree milestones

Jan. '84	Consent Decree takes effect.
Aug. '87	U.S. District Court Judge Harold Greene rules in first triennial review. Maintains ban on RBHC manufacturing, long distance and provision of information content.
Nov. '87	RBHCs appeal ruling.
April '90	Appeals court upholds ban on manufacturing and long distance. Orders Greene to reconsider ruling on information services.

GRAPHIC BY SUSAN J. CHAMPENY

DEC/Apple pact to bear first fruit

By Laura DiDio
Senior Editor

FRAMINGHAM, Mass. — Digital Equipment Corp. next month will unveil software that enables a VAX to act as a server for networked Apple Computer, Inc. Macintoshes and lets Macintoshes exchange data and E-mail with other systems on a DECnet.

The software, VMS Services for Macintosh, is scheduled to be announced at a joint DEC/Apple press conference in New York on May 2, *Network World* has learned. It is the first fruit of the January 1988 DEC/Apple alliance.

VMS Services for Macintosh consists of software that runs on a VAX minicomputer and on Macintoshes in an AppleTalk net. The product enables the VAX to be used as a file and print server for Macintoshes and allows

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IS EXECS LOOK to exert greater control over distributed systems. Page 2.

INTERNET GROUP mulls two protocols that would increase routing efficiency on TCP/IP networks. Page 2.

AT&T UNVEILS RISC minis that double as servers. Page 4.

WANTED: CARRIER willing to route 800 calls with user's own data base. Page 4.

EX-DREXEL IS employees face bleak job prospects. Page 5.

USER CREDITS IBM's CallPath with helping it streamline operations. Page 6.

TWISTED-PAIR TROUBLES can turn into "Alligators in the Swamp." Page 62.

NEWSPAPER

FEATURE

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An element-ary look at network management

By Salvatore Salamone
Features Writer

DATACOM BUYER'S GUIDE

Whether it's for a modem, switch or T-1 line, a network element management system provides more specific information about an individual network component — or element — than a higher level net management system can. And more detailed information gives users better control over components.

Companies can also use the remote control capabilities offered by many of the element management systems to reduce personnel costs. These functions free users from having to station employees in remote locations. Additionally, the diagnostic and reconfiguration features of many element management systems make it unnecessary for a company to put a technician on the road every time a problem occurs.

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Court instructs Greene to rethink info services ban

Judges say Greene should use less stringent criteria to decide if RBHCs may offer services.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — A federal appeals court last week ruled that U.S. District Court Judge Harold Greene erred in continuing the ban on RBHC provision of information services and sent the case back to him for reconsideration.

A three-judge panel from the U.S. Court of Appeals for the District of Columbia said that in the triennial review of the Consent Decree in 1987, Greene used the wrong criteria in deciding whether to allow the regional Bell holding companies to offer information services.

While the appeals court ordered Greene to reconsider the ruling, the action does not necessarily mean the RBHCs will be allowed to enter the information services market. Nonetheless, local carriers labeled the ruling a major victory.

The judges upheld Greene's decision to maintain bans on RBHC manufacturing and provision of long-distance service. But they said Greene should use less stringent criteria than he has in the past in deciding whether the RBHCs can enter those two markets. That could make it easier for the local carriers to shake off those restrictions during the second triennial review this year.

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Users who distribute nets should centralize control

Nets lacking single control point prone to disaster.

By Wayne Eckerson
Senior Writer

When it comes to distributed systems, the price of freedom is eternal vigilance.

Distributed systems, which are increasingly being used to support mission-critical applications, give end users greater control over computing resources, applications and data. But they also heighten the risk that a company will suffer a crippling systems outage or data loss. End users often fail to implement adequate procedures for maintaining systems and safeguarding data.

Also, incompatibility of distributed systems and applications can hamper companywide communications and make it difficult to establish enterprise networks.

Growing use of distributed systems is also changing the role of information systems (IS) executives. Instead of serving as the guardians of centralized corporate systems and data, IS executives are working to establish procedures for controlling the acquisition and use of computer resources. Some are issuing guidelines to end users for maintaining systems, while others are providing direct support through on-

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Internet task force mulls plans for efficient routing

By Tom Smith
New Products Editor

The Internet Engineering Task Force (IETF) is weighing the merits of two protocols that promise to improve the efficiency of routing data among devices from multiple vendors in Transmission Control Protocol/Internet Protocol environments.

IETF — part of the Internet Activities Board, which coordinates Internet research and development and sets TCP/IP standards — has working groups studying two protocols: Open Shortest Path First (OSPF) and Dual Intermediate System-to-Intermediate System, which was proposed by Digital Equipment Corp.

Internet is the nationwide network linking government, academic and commercial users.

DEC's proposal was initially developed for routers supporting Open Systems Interconnection and then later revised to support TCP/IP as well. The OSI version is referred to as Intermediate System-to-Intermediate System, whereas the version supporting both protocols is called Dual Intermediate System-to-Intermediate System. The latter is intended to provide TCP/IP users with a migration path to evolving OSI standards.

OSPF is exclusively for TCP/IP environments and is currently a proposed Internet standard. Dual

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Briefs

3Com, HP left at altar. It seems 3Com Corp. was nearly acquired by Hewlett-Packard Co. late last month, but the deal fell through at the last minute to the consternation of both companies. The deal evidently went sour when 3Com's stock — which was taking on bargain-basement characteristics earlier in the year — rebounded enough to push the price too high for the conservative HP.

The deal came so close that 3Com representatives on March 28 arranged for members of the press to discuss a major announcement with 3Com Chairman William Krause but had to cancel the interviews. The companies have been close to an agreement for some time; HP bought a 5% interest in 3Com in February 1989, and Krause spent 14 years at HP before joining 3Com in 1981.

AT&T announces fractional T-1 cuts. AT&T last week said it has added off-peak evening and night/weekend rate classes to its Accunet Spectrum of Digital Services (ASDS) fractional T-1 service that are lower than peak daytime rates by 28% and 20%, respectively. Evening rates cover usage from 5 p.m. to 11 p.m. on weekdays, and night/weekend charges cover usage on weekends and from 11 p.m. to 8 a.m. on weekdays. Both go into effect May 1.

AT&T also said it will roll out ASDS in 84 more cities by late May, most of which are on the East Coast or in the Midwest. Among the cities to be included are Annapolis, Md., and Boise, Idaho.

Report assails int'l calling rates. Users are being overcharged more than $10 billion per year for international telephone calls, the London-based *Financial Times* concluded last week. The newspaper said the world's dominant carriers, including AT&T, British Telecommunications PLC and Deutsche Bundespost Telekom, cooperate in secrecy to establish international calling rates that far exceed cost. The report concluded that if "free competition were introduced, prices would plummet, the volume of traffic would grow and services would proliferate."

Centrex users want ANI. The National Centrex Users' Group (NCUG) last week said concerns over caller privacy should not hinder the implementation of automatic number indentification (ANI). NCUG said most consumer concerns can be overcome by imposing prudent, but not excessive, regulation. The group suggested that the phone numbers of customers with unlisted numbers not be forwarded to the called party and that businesses warn in phone listings that they use ANI.

IBM, Western Union forge E-mail link. IBM and Western Union Corp. last week announced they will link their electronic mail networks using X.400-based gateways. The agreement will enable users of IBM Information Network's Screenmail service to swap messages with users of Western Union's EasyLink E-mail service.

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Service co. wants to use its own data base for 800 call routing

ATI seeks carrier; says plan will improve service, cut costs.

By Paul Desmond
Senior Writer

WAYNE, Pa. — In an effort to improve service and cut costs, Applied Telematics, Inc. (ATI), a company that provides enhanced telephony services to retailers, is looking for a carrier willing to let ATI provide 800 call routing instructions from its data base.

ATI currently offers a service in which it terminates toll-free 800 lines for its national retailer customers and routes calls to the retail outlet closest to the caller.

When ATI answers calls, a voice response unit asks callers to punch in their phone number. ATI compares the number to its data base and then forwards the call, automatically and within 30 seconds, over WATS lines to the appropriate store ("Patented call-routing tool boon for retail industry," *NW,* Aug. 1, 1988).

The system lets prospective customers talk to salespeople while their interest is at its peak, as opposed to connecting customers with an operator who gives out another number to call.

But now ATI said it is hoping to take that patented process, dubbed Instalink, a step further by cutting itself out of the call path and doing away with the WATS links, said company President Ian Michel.

The company is seeking a carrier that will agree to hand off automatic number identification (ANI) and dialed number identification service (DNIS) data to ATI for calls placed to 800 numbers owned by ATI clients. The 800 call itself, however, will not actually be routed to ATI.

Instead, ATI will feed the ANI and DNIS data into its data base to decide where the

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New AT&T minis positioned as network servers

By Tom Smith
New Products Editor

ORLANDO, Fla. — AT&T Computer Systems last week introduced a family of Reduced Instruction Set Computer (RISC)-based minicomputers that can be used as network servers.

The company, which announced the products at a customer symposium here, also introduced an Ethernet bridge/router that acts as a media access control-layer bridge and a network-layer router.

The new 7000 Series minicomputers can execute from 14 to 112 million instructions per second (MIPS) and can support 128 to 1,000 workstations.

Offered through an OEM agreement with Pyramid Technology Corp., the minicomputers are higher performance machines than AT&T's 3B2s, which boast a maximum of 15 MIPS, said Howard Mitchell, director of product management for minicomputers and high-performance computers at AT&T Computer Systems.

The servers support Unix System V Release 3 and Berkeley Software Distribution 4.2 and 4.3, as well as Sun Microsystems, Inc.'s Network File System.

The new minicomputers can execute from 14 to 112 MIPS.

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They can support DOS, OS/2 and Unix workstations. By year end, they are expected to be able to support Ethernets and Starlans running AT&T's StarGroup Software LAN Manager Server, Hewlett-Packard Co.'s LAN Manager/X and other LAN systems such as Novell, Inc.'s NetWare.

The three models in the 7000 Series — the System 7020, System 7040 and System 7080 — are based on a multiprocessor RISC architecture. Single-CPU machines can process 14 MIPS; users can add more processors for more power.

The System 7000 also supports Systems Network Architecture, Binary Synchronous Communications and X.25 protocols.

The System 7000 family is available now. A System 7020 with two CPUs, disk capacity of 15G bytes and support for 128 workstations is priced at $88,000. A System 7080 with eight CPUs, 64G bytes of disk capacity and support for up to 1,000 workstations starts at $225,000.

AT&T Computer Systems also introduced an Ethernet brouter that supports speeds ranging from 9.6K to 4M bit/sec.

The StarWAN Multi-Protocol Brouter performs bridging for protocols such as Digital Equipment Corp.'s Local Area Transport (LAT). It performs routing for Transmission Control Protocol/Internet Protocol, Open Systems Interconnection, DECnet, Xerox Corp.'s Xerox Network Systems and Apple Computer, Inc.'s AppleTalk.

The product can support a maximum of 12 Ethernet LANs. It will be available in May 1990. Pricing starts at $17,715. ☑

Ex-Drexel IS employees still bitter

By Joe Panepinto
Staff Writer

NEW YORK — When more than 100 ex-employees of Drexel Burnham Lambert, Inc. appeared on "The Phil Donahue Show" two weeks ago, few had kind words for their former employer.

Indeed, many of the more than 500 information systems (IS) workers who found themselves without jobs after the sudden demise of the brokerage firm in mid-February are bitter about what happened to them. The employees were laid off with no word about severance pay or benefits.

Some higher level IS executives who held supervisory positions with Drexel landed jobs at other brokerage houses on Wall Street; however, many other network professionals, including technicians and network operators, are having a tough time finding work in an increasingly hostile hiring market.

> "The manager over there promised me the world, and it never happened."
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Former Drexel employees said recent layoffs throughout the financial services industry have flooded the market with job seekers.

"I'm looking into banks right now and would take anything I can get my hands on," said Dominick Loverde, a network operator whose resume is on file with a dozen headhunters in the New York area. "I don't want to settle for just anything, but I'm out of work six weeks now. I just want to get back to work."

After nearly a month of uncertainty, Drexel doled out two weeks' severance pay to laid-off workers, regardless of length of service, former employees told *Network World*. But the once high-flying Wall Street firm gave no indication of when or if any additional benefits would be delivered.

"The manager over there promised me the world, and it never happened," said Loverde, who worked at Merrill Lynch & Co., Inc. here and The Dun & Bradstreet Corp. in New Jersey before moving to Drexel four years ago. "I feel that I got the short end of the stick."

Some network pros such as Brian Forman were willing to take pay cuts or work in other areas just to secure a job. Even so, it was a month before Forman landed a data processing job at a small brokerage firm on Wall Street.

"I did better than some, worse than others," Forman said. "What are you going to do? That's big business. We are little acorns

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DEC announces RISC-based servers with greater MIPS

By Walter Sweet
West Coast Correspondent

PALO ALTO, Calif. — Digital Equipment Corp. last week unveiled three new high-performance Reduced Instruction Set Computer (RISC)-based servers that offer almost four times the processing power of previous models.

The new servers include two floor-standing units. The DECsystem 5830 is a three-processor server that operates at 48 million instructions per second (MIPS), while the DECsystem 5840 is a four-processor model that runs at 62 MIPS. Both servers run Ultrix Version 4, the company's version of the Unix operating system, which now supports symmetric multiprocessing (SMP).

DEC also unwrapped the DEC-

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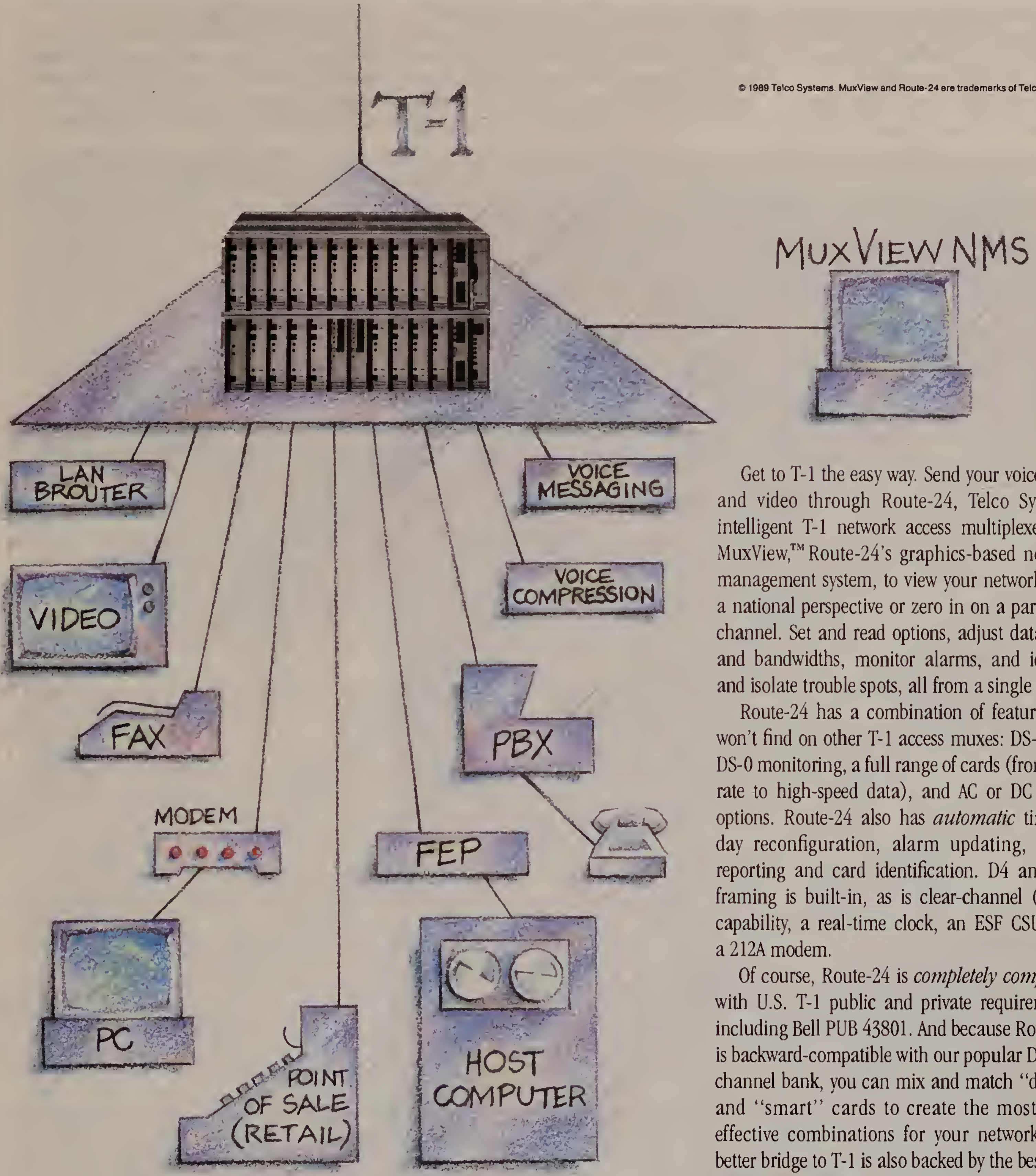

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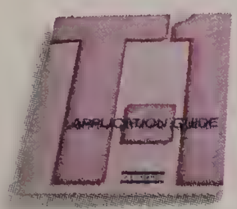

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Met Life to use IBM's CallPath for service edge

By Bob Wallace
Senior Editor

TULSA, Okla. — Metropolitan Life Insurance Co., one of the first beta users of IBM's CallPath offering, credits the private branch exchange-to-host link with streamlining customer service and shortening the time required to process inquiries.

Metropolitan Life, one of the nation's largest insurance firms, plans to install CallPath at 11 other sites within the next year, including all 10 of its group insurance customer service centers.

"The extra edge of giving customers the image of being a bit more professional than the next insurance company is how we've been selling CallPath [within Metropolitan Life]," said Darlane Hoffman, assistant vice-president of telecommunications at the firm.

Introduced in May 1989, CallPath has two main components: CallPath 9750, which runs on the IBM 9751 CBX, and CallPath Host, a CICS/MVS application for System/370 mainframes. The latter comes with software that runs on a dedicated IBM Personal System/2 under NetView/PC and provides the interface to the 9751 switch.

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AT&T moves to protect 800 users

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tween its points of presence and local exchange carrier end offices.

The trunks, which will be operational by the end of the year, will link local switches to different AT&T switches in each LATA and provide both trunk and switch redundancy. The new trunks will be able to put overflowing traffic on the lines currently used to carry 800 traffic and other long-distance calls to AT&T.

■ **Separate signaling network.** AT&T will establish a backup signaling network for 800 service by year end. The network, dubbed Alternate Signaling Transfer Network (ASTN), will be based on the company's existing Common Channel Signaling System 6 (CCS6) network. AT&T is scheduled to complete its migration to a newer CCS7 signaling network next month.

The backup net, which will be bolstered by the addition of more trunks between signal transfer points, will give AT&T an edge over rivals that are still installing their first signaling networks to support advanced 800 services.

AT&T says that in the event of a CCS7 disruption such as the Jan. 15 outage, it will be able to switch from CCS7 to the CCS6 net with minimal disruption to users.

■ **Duplicated net control points.** Although AT&T's 74 network control points (NCP) are built in matched pairs and each has a built-in redundant processor, the company will further safeguard the machines by splitting up the pairs and separating them geographically. NCPs are used to translate 800 numbers into user telephone numbers. The new NCP configuration, expected to be in place by the end of 1991, will provide more options in crisis situations, AT&T reported.

■ **Alternate number translation.** As a further safeguard against NCP failure, AT&T is equipping all 114 of its 4ESS switches to provide emergency translation of critical 800 numbers. Users can begin buying storage space in the 4ESS translation data bases in the third quarter of this year. Pricing has not been determined.

■ **Real-time network routing.** AT&T will also upgrade the 4ESSs to support 113 call paths through the network, compared to the 21 paths supported by its Dynamic Non-Hierarchical Routing software used today. The carrier will begin using the new software, which will reduce the chances of call blockage, networkwide in early 1991.

■ **Fast Automatic Restoration (FASTAR).** Another routing upgrade is FASTAR, a routing algorithm used to instruct T-3 Digital Access and Cross-Connect Systems to reroute traffic carried by the 45M bit/sec fiber-optic facilities around congestion and failed facilities.

AT&T said a fiber link from Cheshire, Conn., to Springfield, Mass., was knocked out earlier this year. It took nearly two hours to reroute the first T-3 circuit and four hours to reroute the remaining circuits. With FASTAR partially implemented in 1991, AT&T will be able to reroute up to 72 T-3s in 20 minutes. When fully deployed in 1992, AT&T will be able to reroute the same number of circuits in seven minutes.

■ **Express routing.** AT&T also announced two new Megacom 800 routing features that will be introduced by mid-year. Split Access Feature Egress Routing (SAFER) is designed for customers with a single call center supported by a T-1 line. If the 4ESS switch serving the center cannot complete calls over the T-1 line, calls will be routed to another 4ESS and then routed over a separate T-1 trunk.

Alternate Destination Call Routing (ADCR) is targeted at customers with two or more 800 call centers. With ADCR, 4ESSs can direct calls to other prespecified sites if the first site is knocked out or busy.

SAFER and ADCR are scheduled to be available by mid-year.

Dataquest's Sazegari said the moves will help AT&T stave off mounting competition in the 800 services market.

"Although AT&T is by far the 800 services market leader with about 85% of the business last year," he said, "they have to stay competitive, and that means making the network as reliable as possible and introducing more new features." ◻

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Court tells Greene to rethink ban

continued from page 2

"With this refined competitive analysis that the court of appeals has given us, I think there's a very great chance of securing relief from the remaining restrictions in subsequent triennial reviews," said Stephen Shapiro, one of the attorneys representing the RBHCs in the appeal. "I think it [will be] substantially easier to get relief now."

During the 1987 triennial review, Greene said the RBHCs still maintained bottleneck control of the local exchange and could use that advantage to impede competition in the three prohibited business areas. On that basis, he ruled that none of the business restrictions could be lifted.

However, in the ruling last week, the appeals court said Greene should have reviewed the information services restriction using a different legal test than that used in weighing the other two restrictions. This is because the main parties to the Consent Decree — AT&T, the RBHCs, the Department of Justice and the Federal Communications Commission — were in favor of lifting the information services restriction.

The appeals court judges said that according to a provision in the Consent Decree, uncontested changes should face a less stringent test than those that are contested.

In his findings, Greene used a legal test that prevents the RBHCs from entering information services as long as there is any substantial possibility that they could use their network control in an anticompetitive fashion. The appeals court said Greene should have prevented the RBHCs from entering information services only if it was certain that the RBHCs would act anticompetitively.

"Uncontested motions for modification involving information services should be approved so long as the modifications satisfy the public interest standard," the court said. "The appropriate question is whether the modification would be certain to lessen competition in the relevant market."

Attorneys say it will be much more difficult to demonstrate with certainty that the RBHCs will try to impede competition.

Shapiro said the court gave Greene a clear sign that he made the wrong decision about the information services restriction and should lift the ban. "I think it's overwhelmingly likely" he will, Shapiro said.

However, the appeals court judges felt that there was enough uncertainty on the issue that, rather than reversing Greene's decision and stripping away the information services restriction themselves, they chose to send the case back to Greene. The appeals court judges said it is possible that even if Greene had used the proper legal test, he might have reached the same conclusion.

James Blaszak, attorney for the Ad Hoc Telecommunications Users Group, which opposes lifting restrictions, said it is not clear that the ban on information services will be lifted. He said that even in a new proceeding, Greene may rule to keep the ban in place.

One major question now is whether anyone will appeal last week's ruling to the U.S. Supreme Court, and what, if any, effect that would have on the case before it goes back to Greene.

However, Blaszak acknowledged that it will be easier for the RBHCs to get the information services restriction lifted. "I think [the decision] shifts the burden of proof" from the RBHCs to the parties opposing the lifting of restrictions, he said.

Although the appeals court decision will not force Greene to make an immediate decision on manufacturing and long-distance restrictions, it may make it easier for the RBHCs to enter those areas, Blaszak said.

While they declined to overturn Greene's continuance of the bans on manufacturing and long distance, the judges said Greene should be using a less stringent set of conditions for RBHC entry into the two areas.

In the first triennial review, Greene said the RBHCs should be kept out of the restricted businesses because there was a likelihood they would subsidize the new ventures with ratepayer money. Cross-subsidies could lead to higher rates for customers, he said.

The appeals court, however, said that Greene should not consider factors such as the effect on ratepayers in determining whether the business restrictions should be lifted.

"Concern for the ratepayers' welfare is primarily the responsibility of the FCC and state regulators, not the district court," the judges stated in their findings. "To the extent that the district court's consideration of cross-subsidization focused on the danger that the [RBHCs] would overcharge local ratepayers, it was misconceived."

In the future, Greene should consider only whether cross-subsidies might drive competitors out of the market or preclude them from entering.

Blaszak conceded that the RBHCs may have a better chance to get the restrictions lifted now. "The appeals court interpreted [the Consent Decree] in a way that suggests it might be easier in the future to obtain [relief] on long distance and manufacturing," he said.

If the restrictions are lifted, it could be a blow to customers. The Ad Hoc Telecommunications Users Group "is concerned that if the RBHCs are allowed to enter these markets, cross-subsidization and thus higher rates will be in the offing," Blaszak said. "There's utterly no evidence that the RHBCs face any significant competition that would restrain their monopolistic pricing practices." ◻

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Lotus/Novell merger surprises LAN users

continued from page 1

advantage of Lotus' relationship with Sybase, Inc., which developed the technology used in the SQL Server. SQL Server is expected to be the foundation for many emerging client/server applications. Lotus has a 15% stake in Sybase, and sources said it plans to develop a version of SQL Server for Novell's NetWare.

For Lotus, the agreement promises to boost its presence in the market for network application software, which is critical to the continuing success of its cash cow 1-2-3 spreadsheet product, analysts said.

Lotus made its most important networking announcement last December with the introduction of Lotus Notes, a groupware product five years in the making.

"The two companies' background and philosophies are quite a bit different," said David Perro, industry analyst with Dataquest, Inc., a San Francisco-based market research firm. Lotus has "rested on the laurels of 1-2-3, while Novell has been a highflyer," he said. "But if you look at the long run, together they will probably be positioned to look a lot more like Microsoft than anyone."

The deal

Under the agreement, Novell and Lotus will combine their boards of directors. Jim Manzi will continue as chairman, president and chief executive officer of Lotus, and Ray Noorda will become vice-chairman of Lotus while continuing as Novell's chief executive officer.

The news of the merger, which is expected to be completed by August, came as a surprise to customers of both companies.

"It's a shocker," said Marc Dodge, manager of the local-area network support group at United Parcel Services, Inc., a user of Lotus and Novell products. "I think it makes a lot of sense for Lotus, but I'm not so sure for Novell. I just hope it doesn't stifle the creativity and independent thought that has typically kept Novell 12 to 18 months ahead of the market."

Laurie Antonell, assistant vice-president for microtechnology services at Merrill Lynch & Co., Inc., said, "I'm looking forward to what they'll be able to do with Lotus' new groupware products, which already look very good. This should let them make a good run at Microsoft, whose products we also use."

Lotus and Novell have similar strategies, said Frank King, senior vice-president for the Software Business Group at Lotus. Both companies are striving to make products that work in a variety of operating environments, including DOS, OS/2 and Apple Computer, Inc. Macintosh, he said.

The first results of the merger will be joint marketing efforts, followed by joint product development, King said.

Keeping the spirit

Novell probably sought the merger to diversify, according to Leo Spiegel, executive vice-president of LAN Systems, Inc., a New York-based firm that sells NetWare utility software and installs Novell nets.

"Novell is still doing great, but their networks are getting harder to sell," Spiegel said. "Many customers look for applications first and then worry about the network operating system. Microsoft is both an application and operating system company, and it's important [that] Novell take on these same characteristics." ◪

Senior Editors Jim Brown and Laura DiDio also contributed to this story.

Firm to use own data base for 800 routing

continued from page 4

call should be routed, then ship the routing information back to the carrier. In effect, the carrier will use ATI's data base instead of its own to make the call-routing decision.

Such a scheme will cut the time it takes to set up a call, obviate the need for the caller to input his phone number and reduce telephone charges for ATI and its customers by eliminating the WATS call.

It will also reduce costs by limiting the distance the 800 call travels. Usually, 800 calls are not routed from the originating central office switch until the ANI and DNIS data is checked against a carrier network control point, Michel said.

If ATI can use its own data base to supply call-routing information, Michel said calls to a retailer's 800 number could be routed in about the time it takes to connect any long-distance call, as opposed to the current 30 seconds it takes to route the call here and then out over a WATS line.

Another advantage is that ATI will be able to offer higher quality service, he said. "Even though we boost the line power so you don't get any degradation, there's always that chance."

Michel said the application has uses for businesses other than his because it gives the user a greater amount of control over 800 lines than is currently possible.

Today, users can configure 800 lines to terminate in different locations, depending on time of day, for example, but those decisions are based on a limited amount of relatively static information.

"There are a lot bigger things out there that require those changes to happen instantaneously," Michel said. Companies "might want to have a very detailed lead distribution or customer service system they can design themselves and maintain."

Michel could not say when the ATI system would be up and running because negotiations are still under way with different carriers. ◪

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INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS AND FINANCIALS

Worth Noting

AT&T said it plans to spend about $2 billion out of a total 1990 network construction budget of nearly $3 billion to complete its all-digital network.

People & Positions

Network Equipment Technologies, Inc. (NET) last week said it has named former 3Com Corp. executive **Robert Bressler** to the newly created position of vice-president of corporate architecture.

In his new position, Bressler will take on the chairmanship of NET's Corporate Architecture Board, which coordinates the continuing development of NET products to help ensure consistency between product lines and match product capabilities with customer requirements.

He will also be responsible for new technology ventures. Bressler will report to **Walter Gill,** a cofounder of NET and the company's chief technical officer.

For the past four years, Bressler has held senior management positions at 3Com. Most recently, he was vice-president for corporate development and chief technical officer, with responsibility for 3Com's product architectures.

The addition of Bressler will bring local-area network expertise to NET, which is expanding its product line to meet changing customer needs, Gill said.

Ken Murphy was recently named to the newly created post of vice-president of quality and controller at **Pacific Bell,** the San Francisco-based Bell operating company.

Murphy will oversee the company's overall quality planning. He will also advise **Phil Quigley,** Pacific Bell's president, and a team of senior managers on quality issues and activities. Previously, Murphy was controller at Pacific Telesis Group, the parent company of Pacific Bell. ◘

Company slowly building mobile radio net empire

Fidelity Capital unit sets up nationwide service.

By Joe Panepinto
Staff Writer

After cellular telephone knocked the legs out from under the specialized mobile radio system (SMRS) industry, a division of Fidelity Capital Corp. went around the country quietly picking up the pieces with an eye to providing regional mobile data communications service for small users.

Since 1987, Fidelity Capital's Advanced MobileComm, Inc. (AMI) subsidiary has purchased mom-and-pop SMRSs in Atlanta, Boston, Dallas, Madison, Wis., Minneapolis, and Raleigh, N.C., and is operating more than 300 channels to support nearly 5,000 two-way mobile radio units.

AMI intends to continue buying small SMRS companies and setting up mobile radio service systems around the country to serve both the current demand for voice service and an increasing interest in mobile data services, according to George Hertz, AMI president.

SMRS is better suited to data communications than cellular telephony, in which bits and even connections are lost when a mobile unit passes from one cell to another, according to Benn Kobb, editor of *Federal Communications TechNews* in Falls Church, Va. Such a disruption is almost unnoticeable in voice communications but can severely disrupt the transmission of data.

Hertz said AMI wants to offer small users the ability to emulate the highly touted data communications system of Federal Express Corp., giving metropolitan courier services, home-improvement contractors and sales companies an efficient way to communicate from remote host offices with service people in the field via wireless radio links.

Share the brilliance

"When you look at the brilliant technology of Federal Express, you see there are a lot of smaller companies that need that technology," Hertz said. "We want to make that technology available to them."

In the Boston area, AMI has more than 100 channels and offers bypass services with connections to the public switched network along with expansive radio dispatch services.

"Fidelity and everybody else

(continued on page 10)

INDUSTRY BRIEFS

Systems Center, Inc. last week said it has completed its $43.5 million acquisition of the worldwide marketing rights to Net/Master, network management software previously sold by Cincom Systems, Inc.

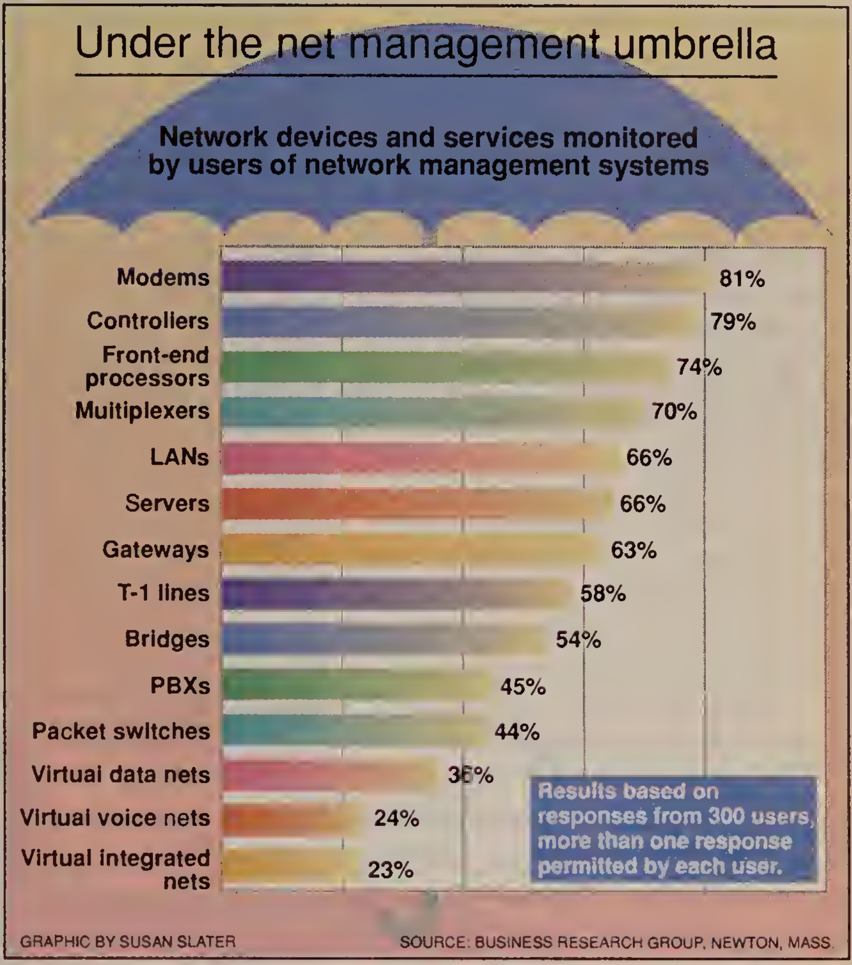
Cincom said 120 employees are also making the jump to Systems Center, including Walt Thomas, director of network management technologies, and Terry Booth, managing director of European operations.

Systems Center has now assumed full responsibility for ongoing Net/Master sales and support. The firm said it also hopes to complete by May a proposed $43 million acquisition of Chatswood, Australia-based Software Developments International Pty., Ltd., the owner and developer of Net/Master.

Clear Communications Corp. last week announced that **AT&T Paradyne** will now be providing nationwide support for its Clearview Surveillance System, a network monitoring software product.

AT&T Paradyne will install the necessary hardware — such as channel service units and Sun Microsystems, Inc. workstations that run the monitoring software — and will provide field support for the system. Clear Communications will continue to install and upgrade the Clearview net monitoring system directly with customers and will work with AT&T Paradyne to remedy any problems, as well as make future improvements.

Robert Copithorne, Clear Communications' president and chief executive officer, said the agreement with AT&T Paradyne extends Clear Communications' network management abilities because AT&T has nationwide reach and around-the-clock professional services. ◘



GRAPHIC BY SUSAN SLATER SOURCE: BUSINESS RESEARCH GROUP, NEWTON, MASS.

LAN control vital to integrated net mgmt.

AT&T, DEC and IBM move to add control of local nets to attract users that seek central control.

By Bob Brown
Senior Editor

AT&T, Digital Equipment Corp., IBM and others are scrambling to add control of LANs to their integrated network management products in what is shaping up as a key selling point for customers.

Net managers are demanding centralized management of local-area networks to get a grip on the growing numbers of LANs within their organizations and to exert control over the proliferating links between LANs and between local- and wide-area networks.

By bringing LANs under the eye of integrated net management systems, users would be able to better coordinate LAN troubleshooting and to monitor user access to net resources.

Furthermore, the move to interconnect LANs via bridges and routers is making the need for centralized LAN management "even more acute," said Kevin O'Neill, vice-president of networking research at Business Research Group, a Newton, Mass.-based market research firm.

Centralized management promises to help users resolve issues of management responsibility when a problem occurs involving the transmission of data from one LAN to another, said Louis Giglio, a software services analyst at Bear, Stearns & Co., Inc., a New York-based investment firm.

"Users are trying to answer the ultimate questions: 'Who's to blame,' and 'Who's going to fix it?' " Giglio said.

Leading suppliers of integrated network management products either already support their own LANs under their network control architecture or plan to add support by the time the product ships.

LAN management partners

The integrated net management systems that LAN vendors have promised to support.

AT&T's Accumaster Integrator
- Banyan Systems, Inc.
- Network Computing, Inc.
- Vance Systems, Inc.

IBM's NetView
- CrossComm Corp.
- Digital Communications Associates, Inc.
- DMB Electronics, Inc.
- Emcom Corp.
- Gateway Software Systems, Inc.
- SynOptics Communications, Inc.
- Ungermann-Bass, Inc.

Digital Equipment Corp.'s DEC mcc Director
- Chipcom Corp.
- 3Com Corp.
- Vitalink Communications Corp.

SOURCES: IBM, ARMONK, N.Y.; AT&T, NEW YORK; AND DIGITAL EQUIPMENT CORP., MAYNARD, MASS.
GRAPHIC BY SUSAN SLATER

More importantly, these same vendors are entering into agreements with third-party LAN ven-

(continued on page 10)

Company building mobile radio empire

continued from page 9

is trying to get in on SMRS," Kobb said. "Over the last 12 months, there has been an explosion of interest in this area."

Hertz said AMI has no intention of linking the regional services together or setting up a national network.

That is in contrast with an announcement made earlier this year by IBM and Motorola, Inc. to market a joint venture through ARDIS Co. that will provide a national mobile data service through Motorola's existing commercial radio network and IBM's internal radio net supporting its 18,000 field service technicians ("IBM, Motorola partner in radio network venture," *NW,* Feb. 5).

ARDIS officials plan to roll out the service this year in more than 8,000 cities and towns across the country. Users utilize the radio network to access IBM 3270-type systems through a Motorola KDT 840 hand-held, wireless terminal equipped with a built-in radio frequency modem.

AMI did not release any specifications of the hardware its users are employing to exploit wireless links in the different markets, though Hertz admitted most early users are simply using the frequency to support voice dispatch traffic.

"The majority of our customers are using voice applications, though we view data applications as more important in the future," he said.

RAM Mobile Data, Inc. of New York is betting on high demand for mobile data service soon and is setting up a radio network that will provide the service to the top 50 metropolitan areas in the U.S.

According to Nick Moreley, an expert on mobile data communications systems based in Boston, the reason for renewed interest in a previously moribund area of technology is simple.

"Companies have made enormous investments in their mainframes, minicomputers and PCs in their offices, and they might as well have smoke signals to communicate with their people in the field," Moreley said.

"It's kind of like taking the office and putting it out into the field."

LAN control vital to integrated net mgmt.

continued from page 9

dors — such as Banyan Systems, Inc. and 3Com Corp. — to support those nets, thereby broadening the appeal of their own network management system (see graphic, page 9). Novell, Inc., which has hinted at tying its NetWare networks into IBM's NetView/PC management system, is expected to make an integrated net management announcement around the third quarter, according to a company spokeswoman.

One challenge facing AT&T, DEC, IBM and other vendors is that currently there are few LAN management products to connect to integrated network management systems, industry observers said.

LAN vendors, consequently, may wind up working with integrated network management vendors to permit those systems to directly control devices on a third-party LAN instead of linking to a LAN management subsystem.

"The bottom line is that customers view local-area networks as an important part of their environment to be managed, just as they would a wide-area network," said Tony Viola, product marketing manager for network management at DEC.

DEC's integrated network management offering, the DECmcc Director, falls under the company's Enterprise Management Architecture (EMA). Chipcom Corp., 3Com and Vitalink Communications Corp. have already announced their intentions to develop links to DECmcc Director.

Jack Baney, IBM's manager of network management software marketing, said LAN management via an enterprise network control system is one of the top three concerns that IBM officials hear from users. IBM has been busy securing interconnection agreements to NetView/PC with such firms as Digital Communications Associates, Inc., SynOptics Communications, Inc. and Ungermann-Bass, Inc.

Accumaster Integrator, AT&T's integrated net management offering that anchors the company's Unified Network Management Architecture, is a manager of element managers that have control over various vendors' LANs and other devices. AT&T plans to support network management for LAN products from Banyan Systems, Network Computing, Inc. and Vance Systems, Inc. by year end.

Suppliers of integrated network management systems are in a race to get LAN vendors, which may have limited development resources, to write interfaces supporting their systems. Hewlett-Packard Co. and NCR Corp., for instance, have embraced open standards-based network management architectures to try to make this task less burdensome on LAN vendors, analysts said.

Until they line up agreements with third-party LAN suppliers, AT&T and DEC are pushing LAN management provided by their own products.

Under its Accumaster Integrator, AT&T offers support for its StarGroup Management Software, which manages its own LANs and network devices. DEC is pushing a package of its previously separate LAN management offerings that will work with its EMA products when they are shipped later this year.

IBM, meanwhile, is pitching its LAN Manager diagnostic software, as well as agreements it has with other vendors to attach net management subsystems to NetView/PC.

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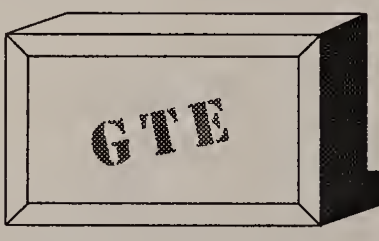

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TELECOMMUNICATIONS

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Worth Noting

AT&T recently announced that it has integrated its Audix voice mail system with Northern Telecom, Inc.'s Meridian SL-1 and SL-100 private branch exchanges and its DMS-100 central office switch.

Carrier Watch

CBS, Inc. last week became the fourth company to sign on with **AT&T** for a Tariff 15 deal, an agreement that will give CBS a 23% discount on Software-Defined Network services, including international calling.

In a filing at the Federal Communications Commission recently, AT&T said it offered the deal in response to an offer MCI Communications Corp. made to CBS. AT&T claims that MCI offered CBS Vnet service at rates 21.9% below tariffed prices.

The AT&T contract, if approved by the FCC, is scheduled to take effect May 12 and run for three years.

AT&T's three previous Tariff 15 deals have all encountered problems at the FCC. A deal for Holiday Corp. was judged illegal by the FCC and had to be withdrawn. A deal for First Commerce Corp. was also withdrawn but before the FCC issued a ruling on its legality.

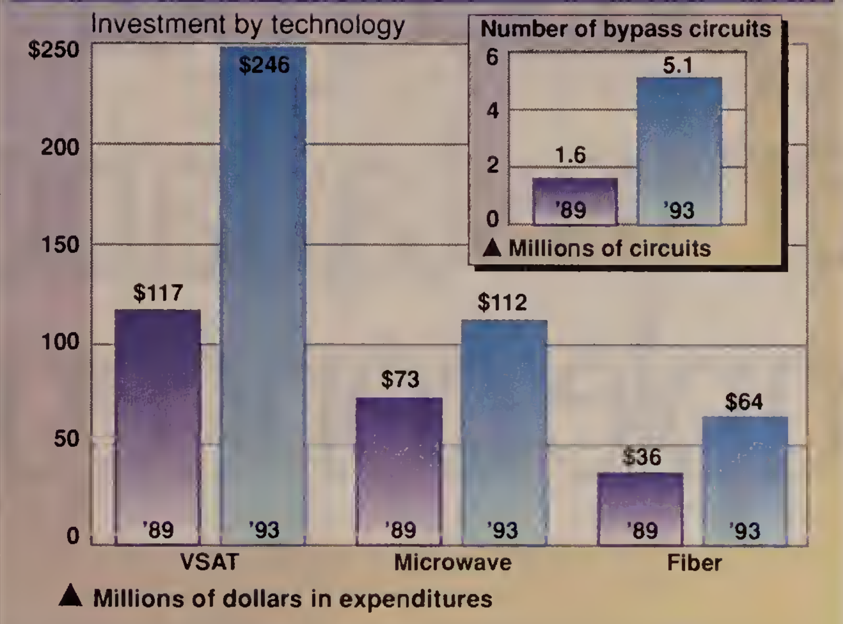
The only remaining network deal, for Resorts Condominium International, Inc., has been suspended for five months while the FCC investigates its lawfulness.

The Ohio Bell Telephone Co. announced last week the sale of 143 lines of digital Centrex to the Judson Retirement Community, an 80-year-old nonprofit organization based in Cleveland.

Warwick Communications, Inc., one of Ohio Bell's 14 authorized Centrex sales agents, sold the central office-based

(continued on page 16)

Bypass carriers to boost network spending



GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: FROST & SULLIVAN, INC., NEW YORK

BellSouth unveils Centrex net management service

Allows customers to monitor and test lines.

By Bob Brown
Senior Editor

ATLANTA — BellSouth Corp. recently announced a Centrex network management service that will let users access central office switches to monitor network alarms and to test lines.

The service will be offered from an AT&T Network Systems Group NetPartner Network Management System, a central office-based system consisting of an AT&T Datakit Virtual Circuit Switch and 3B2/600 minicomputers. BellSouth is the first carrier to buy NetPartner, which AT&T introduced late last year.

BellSouth's operating companies, Southern Bell Telephone and Telegraph Co. and South Central Bell Telephone Co., will market the net management offering as their Performance & Fault Management Service under their line of Customer Network Management Services.

> Customers will be able to monitor and receive alarms and surveillance messages.
>
> ▲▲▲

The service is intended to offer Centrex users net management capabilities that are more competitive with private branch exchange-type management features, BellSouth officials said.

Using an on-site workstation, customers will be able to utilize the service to monitor and receive network alarms and surveillance messages. They will also be able to generate tests on analog circuits and on certain Integrated Services Digital Network lines.

"Adding Performance & Fault Management Service to [our Customer Network Management family] gives our customers the added dimension of being able to monitor the integrity of their network services as it relates to the central office switches," said Rod Beard, product manager for BellSouth Services, Inc.

> BellSouth's service will provide users with proactive management capabilities, Beard said.
>
> ▲▲▲

Although the offering is a monitoring tool, it enables customers to use the same desktop device to access other BellSouth Customer Network Management services in order to receive trouble reports, perform billing functions, and conduct station moves, adds and changes.

BellSouth's Performance & Fault Management Service will provide users with "proactive, instead of only reactive," management capabilities, Beard said.

BellSouth will trial the service at several sites before the end of the year. It will be generally available early in 1991. Pricing has not been determined yet. ☑

Chrysler finds favor in voice processing

Automaker installs AT&T Conversant system to handle more calls while holding line on costs.

By Bob Wallace
Senior Editor

DETROIT — Faced with the prospect of handling soaring call volumes under a budgetary crunch that ruled out adding call center staff, Chrysler Service Contracts turned to a voice processing system for help.

"We were told we had to stabilize costs for three years if we were to be a profitable company," said Edward Knight, dealer and customer relations manager for Chrysler Service, a unit of Chrysler Corp. "That meant using our existing resources more efficiently."

To that end, the company installed an AT&T Conversant Voice Information System at its 24-agent service center here. The center fields calls concerning service contracts from 5,500 dealers nationwide.

The system, which cost $100,000 a year ago, paid for itself in four months, according to Knight.

It now handles about 25% of the 3,000 daily calls to the center, has sped up contract processing by 50% and has freed up agents for more productive efforts.

The Conversant system does the work of an average of 9.9 agents and cuts the time required to process an average call in half, from three minutes to 1½ minutes, Knight said.

Successful victim

Chrysler Service was a victim of its own success. Dealers were selling more service contracts, which meant more calls were coming into the call center here. "We couldn't handle all the incoming calls," Knight said. "Dealers were repeatedly getting busy signals."

Before beginning auto repair work, the dealer dials into the voice response system to see if the customer's auto service contract is valid. With the voice response system, dealers can call during or after regular business hours and process several transactions per call.

"Our dealerships are pleased with the system. For them, it of-

(continued on page 16)

WASHINGTON UPDATE

BY ANITA TAFF

AT&T asks for permission to offer Tariff 12 discounts. AT&T told the Federal Communications Commission last week it wants to add a new discount schedule to its Tariff 12 offerings that would allow customers to get discounts of up to 25% beginning May 14 on intrastate services used in conjunction with their custom network offerings. Tariff 12 currently applies only to interstate charges, and AT&T says this has become "a competitive handicap."

The Expanded Discount Plan will offer a 25% discount on all intrastate Software-Defined Network usage except operator-handled card calls, which will receive only a 5% discount. The plan also includes a 20% discount on Megacom, a 25% discount on Megacom 800 and a 25% discount on 800 Readyline. In states where AT&T does not have tariffs offering discounts at these levels, the discounts will be based on intrastate volumes but deducted from interstate charges.

AT&T claims its competitors are offering their custom network customers discounts based on total traffic volumes from both interstate and intrastate usage. In a filing last week, the company claimed it lost the business of PepsiCo, Inc. to US Sprint Communications Corp. because the rival carrier offered a network with discounts on interstate and intrastate usage. The PepsiCo network supports 2,300 sites, including corporate offices and locations of subsidiaries Frito-Lay, Inc., Taco Bell and Food Systems Divisions.

AT&T said four other major customers switched to US Sprint Communications Corp. during the last year because of deals

(continued on page 16)

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Washington Update

continued from page 13

that offer discounts on interstate and intrastate traffic: Exxon Corp., Florist Transworld Delivery Association (FTD) and Sears, Roebuck and Co., as well as Grand Metropolitan Corp., which is the parent company of Pillsbury Co., Burger King Corp. and Heublein, Inc.

AT&T said it has lost business to MCI Communications Corp., which offers similar packages for businesses including two brokerage firms, Drexel Burnham Lambert, Inc. and Stuart-James Co.

Long nominated to FCC board. William Long, chairman of the Michigan Public Service Commission, was nominated last week to serve on the Federal-State Joint Board of the Federal Communications Commission.

Long was nominated by the National Association of Regulatory Utility Commissioners to replace James Fischer, chairman of the Missouri Public Service Commission, who recently resigned from the board.

The board, which was mandated by the Communications Act of 1934, serves as a forum for resolving jurisdictional disputes that arise between state and federal regulators.

The joint board comprises three commissioners from the FCC, four state commissioners and the chairman of the FCC, Alfred Sikes.

In addition to his role at the FCC, Sikes serves as chairman of the Federal-State Joint Board.

AT&T kicks off WATS promo. AT&T recently introduced a nationwide promotion for new customers of its WATS service. For users that order WATS before June 30 and request installation by July 31, AT&T will offer two deals: It will waive the connection charge for access lines and offer a satisfaction guarantee.

Under the guarantee, if a customer is unhappy with the service and notifies AT&T within 90 days after installation, AT&T will pay all interexchange and local exchange charges necessary for the customer to return to its former carrier. This guarantee is limited to one reimbursement per line per customer.

Carrier Watch

continued from page 13

service to the retirement facility, according to an Ohio Bell spokesman.

"We purchased [Centrex] primarily because we needed a telephone system for our new health care center," said Stanley Jaffe, administrator of financial services for the facility. "In addition, Centrex offers expanded internal and external [calling] capabilities for our two present facilities — Judson Park and Judson Manor."

The Centrex service will support a message center at each building, call transfer and intercom calling, according to the Ohio Bell spokesman. The switch, scheduled to be cut over on April 27, can be expanded to accommodate future growth.

Chrysler finds favor in voice processing

continued from page 13

fers a simple, quick way to process service contract information. [And] they can call at their convenience, 24 hours a day," Knight said.

Chrysler Service has three T-1 Megacom 800 trunks terminating at its automatic call distributor (ACD). The switch reads the four-digit Dialed Number Identification Service (DNIS) code delivered with each call to determine if the caller dialed the consumer 800 number or the dealer 800 number.

The ACD routes consumer calls to Chrysler Service agents and dealer calls over 30 analog lines to the Conversant system. The system prompts the caller to key in the vehicle's service contract number and the service contract's expiration date.

The Conversant system, which emulates an IBM cluster controller, accesses an IBM 3090 mainframe to see if the service contract is good and uses synthesized speech to give the caller an answer. When a transaction is completed, the Conversant system updates the customer's file on the mainframe.

The dealer can transfer from the voice processing systems to an ACD agent by pressing a single key on the telephone's keypad. If after 45 seconds the caller does not hit the key, the call is automatically passed to an agent, Knight explained.

The system has been so successful that Chrysler Service plans to begin using it to process additional calls, including consumer calls, within 90 days, Knight said.

Growth a key factor

Lee McCully, a telecommunications supervisor for Chrysler Service, said one of the reasons the company chose the Conversant system was because of its ability to accommodate future growth and new applications.

Before buying the system, the company visited American Express Travel Related Services Co., Inc. and Citicorp, both early Conversant users.

"We needed to know if the [Conversant] system could handle heavy call volumes," McCully said. "We didn't want to spend all that money on the system and outgrow it shortly afterward."

Knight said the user visits helped in other areas too.

American Express' and Citicorp's "willingness to discuss their experiences with voice response systems was invaluable to us." he said. "We learned a great deal about the technology and how to best implement it."

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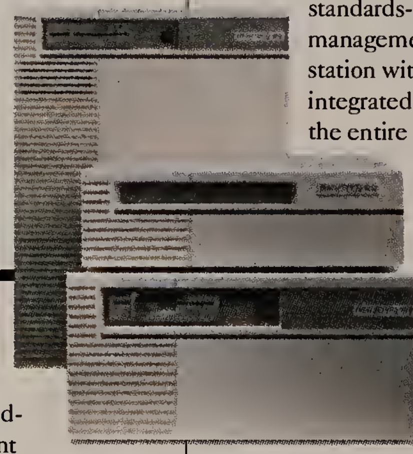

1 Can you support multiple network standards... all at the same time? You need a solution for *all* your users. So Wellfleet handles all the important networking standards, offering both bridging *and* multiprotocol routing in an advanced, symmetric multiprocessor platform. With the industry's highest performance for all your network applications.

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DATA COMMUNICATIONS

PRODUCTS, SERVICES, ARCHITECTURES, STANDARDS AND NETWORK MANAGEMENT

Worth Noting

> "In the future . . . we want to have a much more distributed network that will learn about itself more dynamically and not require a single point of directory services."

Jean Lorrain
Architecture manager
IBM's Signal Converters
and Connectivity Programs
La Gaude, France

Data Packets

Timeplex, Inc. last week enhanced its X.25 packet-switching product line with a new high-end packet switch and a packet-switch network management system.

The **Timepac NP1000** switch supports as many as 28 ports and can handle up to 1,000 packet/sec in 128-byte packet sizes.

Users connect devices such as packet assembler/disassemblers, workstations, front-end processors or terminals to a port on the Timepac NP1000 via full-duplex asynchronous circuits operating at up to 38.4K bit/sec or full-duplex synchronous circuits operating at up to 128K bit/sec.

For devices not linked to the switch via a PAD, the NP1000 runs PAD software that converts incoming data to X.25 or a Timeplex proprietary protocol used to move data between switches.

The NP1000 and other Timepac switches support a dynamic adaptive routing algorithm, which performs network load balancing by routing data through the network on a packet-by-packet basis as opposed to a call-by-call basis. The NP1000 can also transparently convert between private X.25 network addressing and public X.25 network addressing schemes.

The NP1000 complements the existing NP500 and NP100E, and costs between $16,600 and $56,000, de-

(continued on page 18)

Retailer installs VSAT net to bypass telcos

Regional data net offers greater reliability and insulates user from leased-line cost increases.

By Tom Smith
New Products Editor

HENDERSON, N.C. — Rose's Stores, Inc. recently completed installation of a $3 million, 260-node VSAT network spanning 13 Southeastern states and said it plans to install a private hub so it can better manage the communications needs of a growing number of stores.

The very small aperture terminal network was chosen to replace multidrop leased lines because it offers greater reliability and insulates the $1.5 billion general merchandise retailer from leased-line cost increases.

It also enables the company to respond more quickly when new stores open or existing ones relocate.

Rose's Ku-band VSAT net carries a variety of IBM Systems Network Architecture-based applications, including a point-of-sale system, credit card authorization and on-line receiving. The store chain said it later plans to add video and voice traffic to the network.

Private hub

A private hub will be installed within a year in a new data center the company is erecting in place of its current facility, which cannot handle further expansion, according to Jim Pizagno, manager of information processing for the company based here.

Each store has shared access to six 32K bit/sec segments of bandwidth on a transponder supplied by Tridom Corp., the AT&T subsidiary from which Rose's purchased the network. This enables Rose's stores to beam data to the transponder, which relays the data down to a Tridom shared hub in Marietta, Ga. Rose's data center is linked to the hub via three 56K bit/sec lines. The shared hub also supports a 512K bit/sec uplink to the transpon-

(continued on page 18)

> The VSAT net enables the company to respond more quickly when new stores open.

▲▲▲

Credit card firms jumping to radio-based retail nets

By Paul Desmond
Senior Writer

SAN FRANCISCO — Visa USA, Inc. last week announced it has contracted with Digital Radio Networks, Inc. (DRN) for a radio-based credit card service that cuts authorization time in half compared with dial-up networks.

The announcement follows a nine-month pilot test with 100 merchants in California, Florida, Georgia and Texas.

During the test, response times ranged from five to seven seconds, compared with 15- to 25-sec response times using dial-up links.

Now Visa will make the service available to any of its member financial institutions and retailers.

Visa's announcement here follows a similar disclosure two weeks ago from MasterCard International, Inc. that it, too, will roll out the DRN service to its retailers following a successful pilot test of the system.

"It's a way for us to bypass using Bell operating companies and dial telephone lines," said Sharon Cline, vice-president of MasterCard Automated Point-of-Sale Program, which conducted the MasterCard pilot. "By doing that, not only are we able to provide an added value to our merchants, we're able to add some competition in the telecommunications market, and that's going to drive prices down to the benefit of us and our customers."

Plus for MasterCard

The DRN system is also a plus for MasterCard merchants, who Cline said are accustomed to a response time of about 12 seconds for dial-up credit card authorizations.

"We are able to take that transaction time down to five seconds," Cline said. MasterCard

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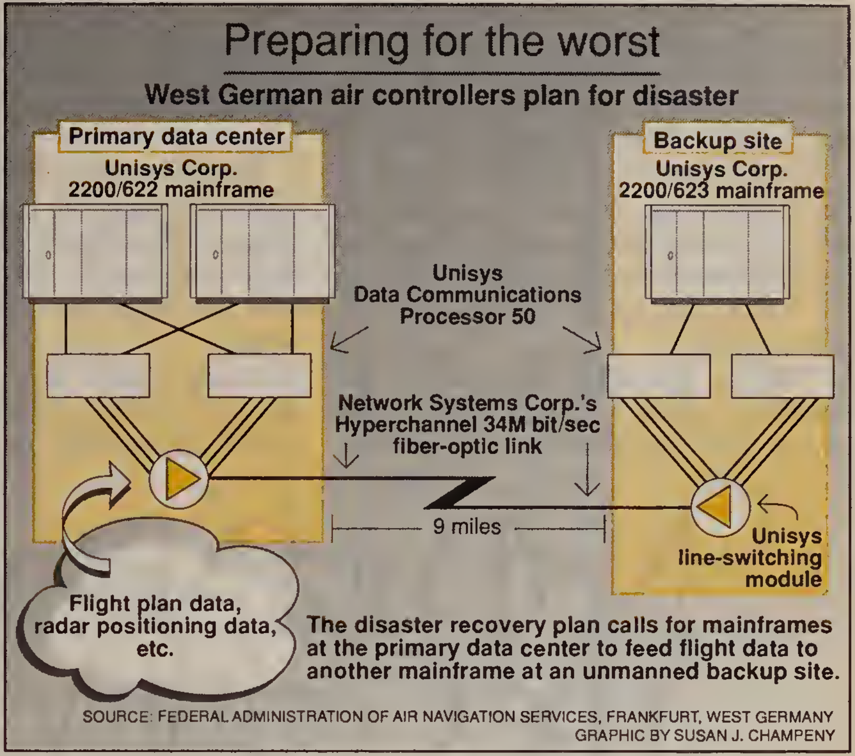
Preparing for the worst

West German air controllers plan for disaster

The disaster recovery plan calls for mainframes at the primary data center to feed flight data to another mainframe at an unmanned backup site.

SOURCE: FEDERAL ADMINISTRATION OF AIR NAVIGATION SERVICES, FRANKFURT, WEST GERMANY
GRAPHIC BY SUSAN J. CHAMPENY

German air traffic control service gets net overhaul

Firm plans Hyperchannel link for backup net.

By Paul Desmond
Senior Writer

FRANKFURT, West Germany — Network managers for Germany's air traffic control organization here are preparing for a $40 million network upgrade that will provide comprehensive disaster recovery, including an entire backup data center.

The upgrade calls for replacing a single Unisys Corp. 1183 mainframe with three new Unisys 2200 Series mainframes, which will be networked together to support disaster recovery capabilities.

With the new configuration, two mainframes at the primary data center will each support different applications and act as hot backups to each other. A third mainframe, located nine miles away and connected to the data center via a fiber cable, will support all applications in the event of a disaster at the primary site.

Bundesanstalt fur Flugsicherung (BFS), which translates to the Federal Administration for Air Navigation Services, is charged with directing air traffic for all flights in and out of West Germany, said Jorg Batzer, head of the BFS information processing and display branch. To do that, it accepts data from multiple sources, such as radar devices for aircraft positioning, flight coordination data from other countries and flight schedule data.

Today, BFS has no backup plan in the event its Unisys 1183 mainframe should fail or if there is a major disaster at its airport data center here, Batzer said.

"The question was, 'What will you do if the system is blown up?' The answer was [that] we would be in trouble for sure," he said.

The new configuration, to be installed beginning later this year, promises to remedy that problem.

The plan calls for BFS to split application processing between the two mainframes located in the primary data center, Batzer said.

The mainframes will be interconnected via Unisys Data Communications Processor (DCP) 50s, which act as front-end processors. Should one mainframe fail, the DCP 50s can route data to the other and, within one minute, process both loads.

BFS is also planning to use Network Systems Corp.'s Hyperchannel to support a 34M bit/sec fiber-optic link between the primary and backup data centers, Batzer said. That link will be used to route a mirror image of data processed on the two mainframes to the remote backup nine miles away (see graphic, this page).

If the main data center is knocked out or destroyed, the backup data center can be fully staffed and operational in six hours, Batzer said. Technically, the backup mainframe could be running in about one minute, he said, but since the backup site will be unmanned, it will take time to move network staff.

To manage the remote backup center, BFS expects to use a local-area network based product, which Unisys is now testing at an undisclosed site in Switzerland. That product lets net control personnel using workstations attached via an Ethernet LAN to the host complex in the primary data center monitor the remote data center via a 2M bit/sec Ethernet bridge to another LAN at the backup site.

Retailer installs VSAT net to bypass telcos

continued from page 17

der, enabling Rose's data center to communicate with the stores.

A time-division multiple-access protocol developed by Tridom allocates bandwidth to the stores. It also allows the user to support interactive traffic during the day and batch traffic at night.

One benefit of the satellite network is that it will relieve the user of frequent interruptions associated with its leased-line network, which consisted of 24 9.6K bit/sec circuits with 12 to 14 drops each, Pizagno said.

"We had equipment failures that exposed us to outages, as well as the typical fiber-seeking backhoe," Pizagno said. Equipment failures occurred with modems, leased lines and central office equipment.

Since the user began pilot-testing VSATs about 18 months ago, the network has provided better than 99% uptime, Pizagno said.

Rose's was also experiencing an 8% annual increase in the cost of its dedicated circuits. In contrast, with VSATs, the company will realize a $1.2 million savings over five years after paying for the network.

Another factor that swayed Rose's toward the VSAT network was that it had to wait 60 days on average to install a leased line or take one out of service.

"That kind of lead time really placed restrictions on us as far as growth, [and] we weren't comfortable with [that]," Pizagno said, explaining that over the past five years, the company had increased its roster of stores by 20 to 25 annually.

Now, by contrast, a site survey can be performed by Rose's personnel and Tridom can install a VSAT typically in less than a week.

The company plans in the next year to implement a private hub, which will provide economic benefits in a network the size of Rose's and will allow it to respond better to network additions and configuration changes.

The hub will be installed at a new 28,000-sq-ft data center here that the company plans to occupy within a month.

The data center provides room for a third IBM 3090 mainframe if such an expansion is necessary. The data center will support a T-1 backbone linking the company's six-building campus here. That T-1 net is expected to be operational within 18 months.

Future plans include moving voice traffic to the satellite net within two to three years and adding video traffic next year. Pizagno said the VSAT project shares common goals with each of Rose's net initiatives.

"It is driven by a desire to remain competitive with what other retailers are doing," he said, "but it is also marked by the ability to deliver more products and services at a reduced cost." ◘

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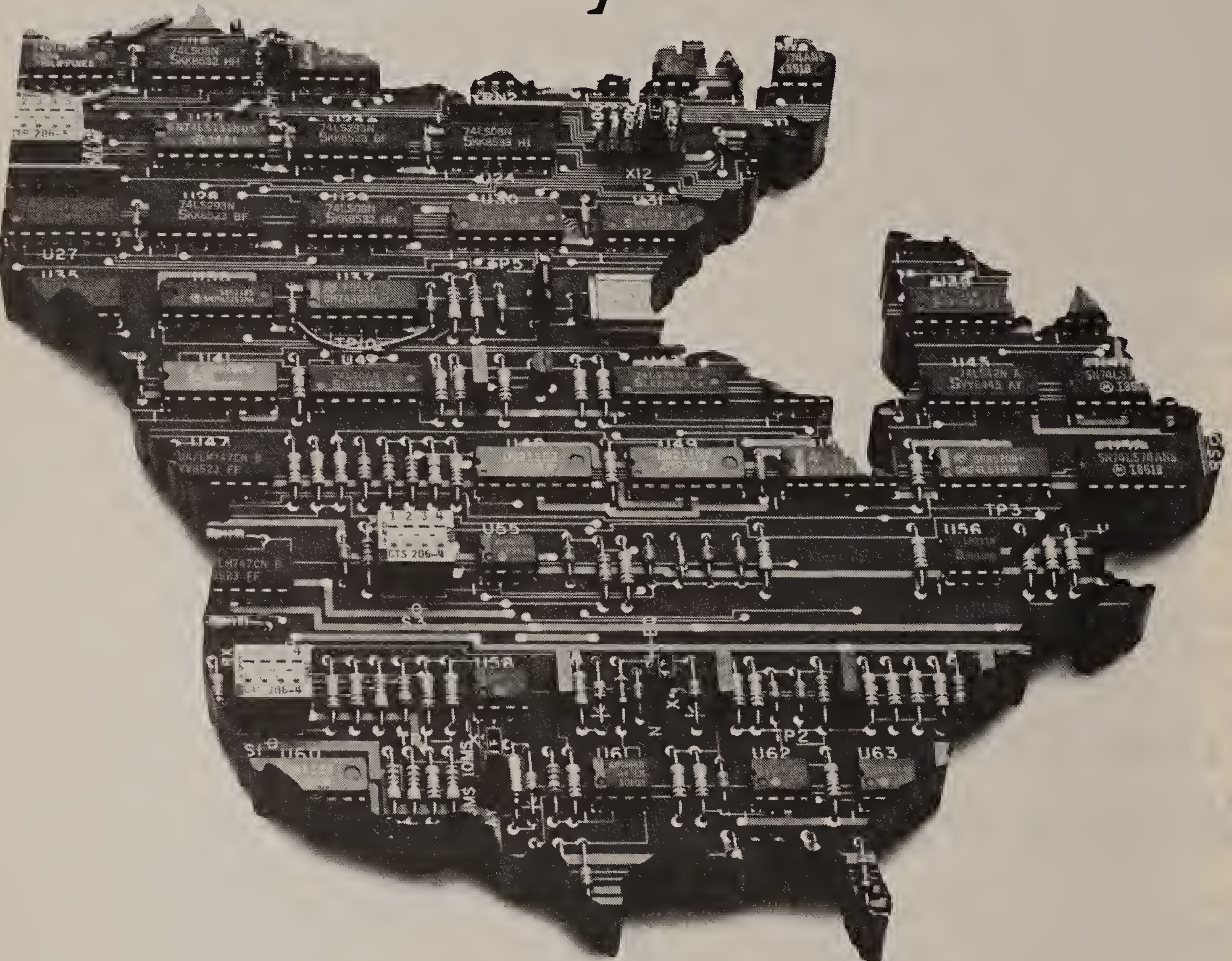

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Credit card firms jumping to radio nets

continued from page 17

charges 2.5 cents more per transaction for the radio service compared to dial-up, but that is in some part offset by eliminating local telephone company charges.

DRN's system is faster than traditional dial-up links because it transmits credit authorization data at a higher speed — up to 4.8K bit/sec vs. a maximum of 1,200 bit/sec for dial-up — and eliminates the time required to establish a dial-up connection.

The system consists of a radio transceiver in the retail outlet that communicates with a base station within the same metropolitan area.

Currently, DRN's network blankets about 60 metropolitan areas, and the company plans to add about 15 more this year, said Craig Stutzman, director of product marketing for DRN.

Base stations are linked via 9.6K bit/sec digital data service lines to one of 13 regional packet-switching nodes, which in turn are linked to one another and to the net control center in Vienna, Va., via 9.6K or 56K bit/sec leased lines.

DRN clients link their private authorization networks to DRN's at one of the 13 regional nodes. ◘

Data Packets

continued from page 17

pending on configuration. The NP500 supports as many as 28 ports and switches 500 packet/sec, while the NP100E supports up to 20 ports and switches 100 packet/sec.

Network Software Associates, Inc. (NSA) last week introduced a developer's kit consisting of educational and application development tools that will enable programmers to build microcomputer-to-host applications using IBM's Advanced Program-to-Program Communications LU 6.2 protocols.

With the **APPC Developer's Kit,** users can build APPC applications on microcomputers that are linked via RS-232 serial port connections. Those applications can then be tested before being migrated to support microcomputer-to-host connectivity. The APPC Developer's Kit includes two copies of NSA's AdaptSNA APPC software, one copy of AdaptSNA APPC + 3270 software, one copy of AdaptSNA Common User Access (CUA) software, APPC training documents and one year of NSA technical support services.

The APPC Developer's Kit costs $995. ◘

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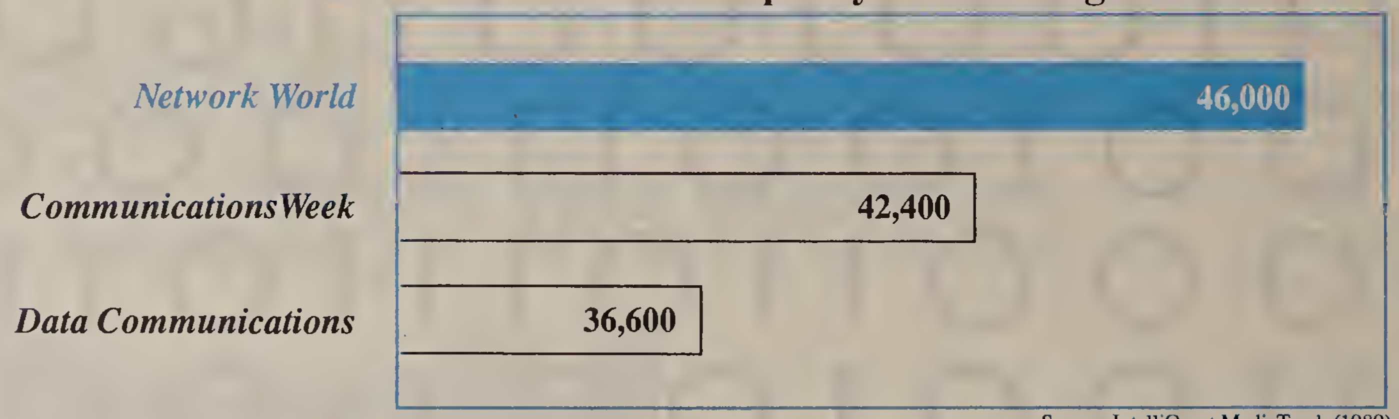

Source: IntelliQuest MediaTrack (1989)

NUMBER OF READERS
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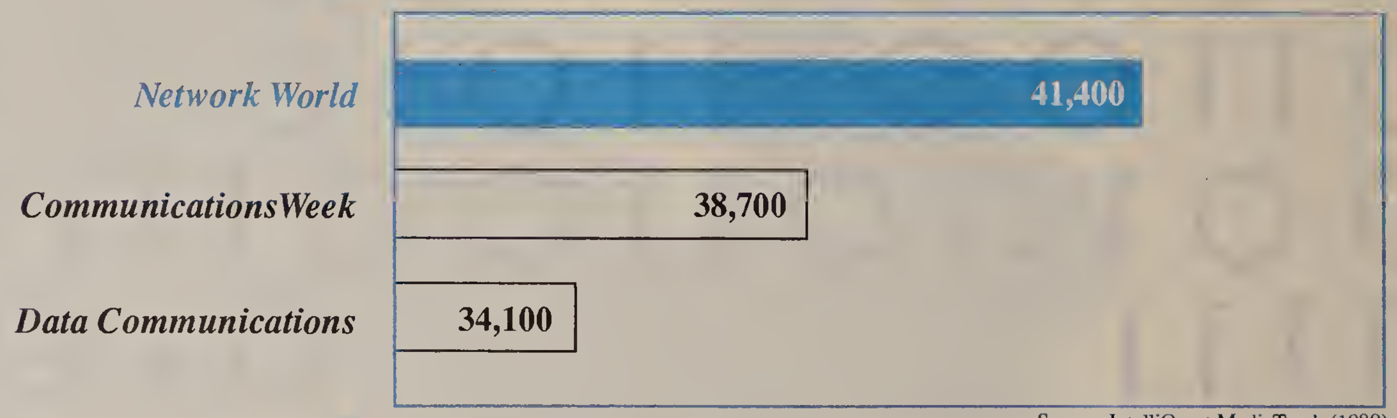

Source: IntelliQuest MediaTrack (1989)

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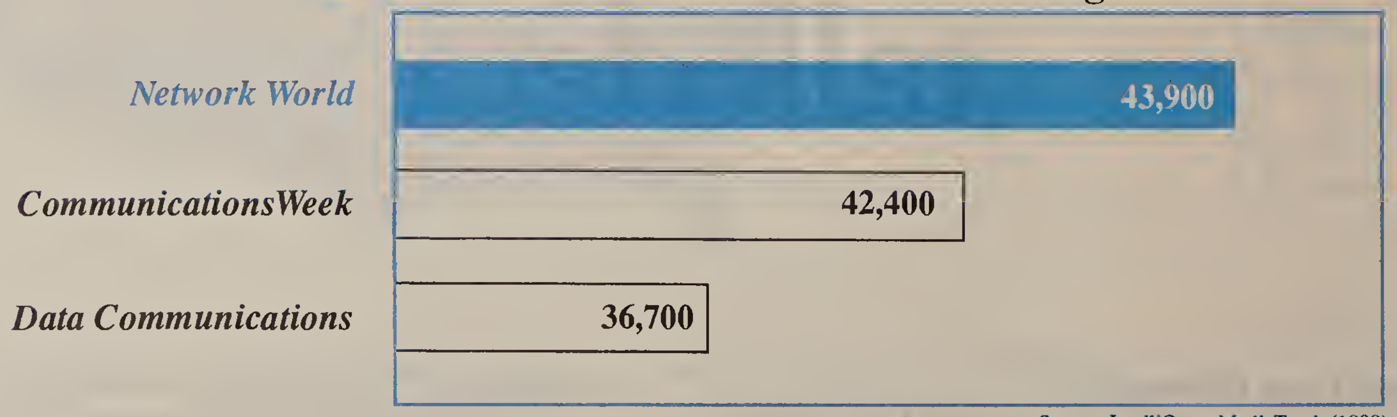

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Worth Noting

> "Computer viruses can create computers with technological Alzheimer's disease. Unless more sophisticated attention is paid to malicious software, the only safe computer may be the one that isn't plugged in, turned on or networked."
>
> **Sanford Sherizen**
> President
> Data Security Systems, Inc.
> Natick, Mass.

Netnotes

Beame & Whiteside Software, Ltd. recently announced a new version of its Beame & Whiteside Network File System (BWNFS) software that is being billed as the smallest, fastest and least expensive DOS client software for Sun Microsystems, Inc.'s Network File System (NFS) on the market.

Version 2.1 of BWNFS has been enhanced with support for DOS 4.X, Sun's Yellow Pages directory services, as well as expanded and high DOS memory. The product enables DOS-based personal computers to access files stored on servers supporting NFS.

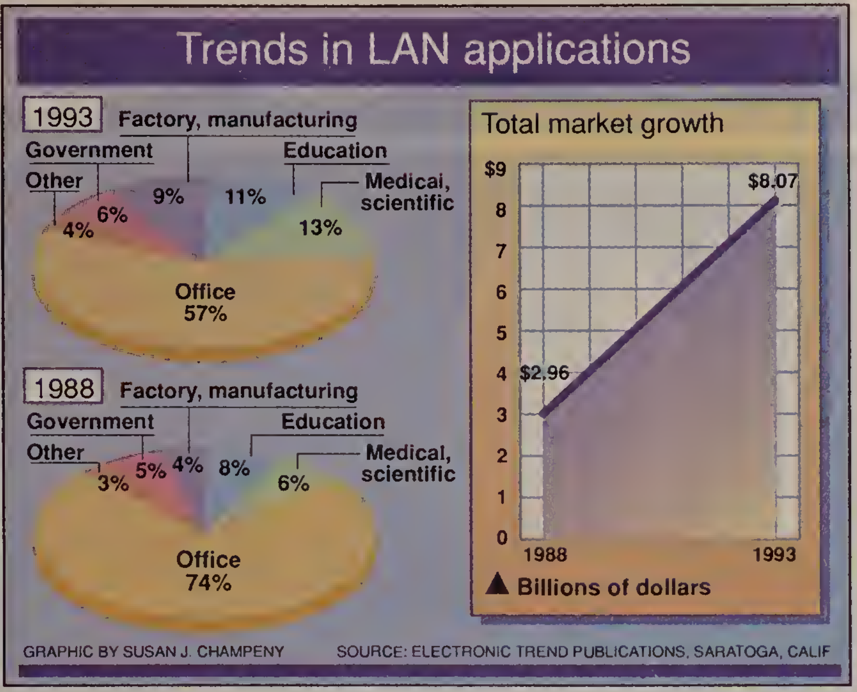
In systems that use expanded or high memory, BWNFS can operate in as little as 50K bytes of conventional DOS memory. The software can also run concurrently with the client shell for Novell, Inc.'s NetWare and comes with drivers for several standard Ethernet adapters from 3Com Corp. and Western Digital Corp.

BWNFS Version 2.1 costs $195 per workstation.

For more information, write to Beame & Whiteside, P.O. Box 8130, Dundas, Ont. L9H 5E7, or call (416) 648-6556.

Adaptec, Inc. this month will begin shipments of two

(continued on page 24)


Trends in LAN applications

GRAPHIC BY SUSAN J. CHAMPENEY SOURCE: ELECTRONIC TREND PUBLICATIONS, SARATOGA, CALIF

DEC X terminal integrates windows, regular programs

Emulates VT-320 to access text applications.

By Walter Sweet
West Coast Correspondent

ANAHEIM, Calif. — Digital Equipment Corp. recently unveiled an X Window System terminal that will let users interact with X Window and DECwindows applications, as well as with existing text applications.

The VT1000 Windowing Terminal is a monochrome device available in 15-in. and 19-in. models that can communicate with VMS, Ultrix and Unix-based host systems using DEC's Local Area Transport (LAT) or the Transmission Control Protocol/Internet Protocol. A thin Ethernet connection supports LAT and TCP/IP simultaneously.

Besides providing access to X Window- and DECwindows-compliant applications, the terminal has built-in local VT-320 functionality and a window manager that will enable users to utilize windows to access existing text applications without modifying the host-based software.

> VT1000 is a monochrome device available in 15-in. and 19-in. models.
>
> ▲▲▲

The VT1000 allows users to move information back and forth between terminal and window applications that reside on different computing systems. The X Window System is an open standard for graphical windowing under Unix that was developed at the Massachusetts Institute of Technology in Cambridge, Mass.

> A thin Ethernet connection supports LAT and TCP/IP simultaneously.
>
> ▲▲▲

With four windows open, a user, for example, could simultaneously display information from DEC, IBM and Unix-based systems, as well as a personal computer server. The user could then create a fifth window to cut and paste information from the other four.

"We see this as giving our customers the ability to get X Windows and visual integration at a price they can afford," said Don Murphy, marketing manager for DEC's video image products. "In the past, it was only available for workstations and personal computers."

He said that users who want high performance and power will continue to use a workstation, while X Window users tend to be less computer-intensive. "These people don't want to get involved in network issues; they want to get their work done," he said. "They want the visual integration benefits X Windows brings."

Judy Estrin, executive vice-president of Network Computing Devices, Inc. (NCD), a Mountain View, Calif., company that sells a competing X Window terminal, applauded DEC's move. She said

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10BaseT still needs market leadership

Although nearly complete, the Ethernet standard won't necessarily ensure product interoperability.

By Walter Sweet
West Coast Correspondent

SAN FRANCISCO — Buyers beware: The so-called 10BaseT-compliant Ethernet products that have been flooding the market since the IEEE 10BaseT Task Force signed off on the draft standard last January will not necessarily interoperate.

Although the 10BaseT recommendation for implementing Ethernet on unshielded twisted-pair telephone wire is unlikely to be changed as it moves through the final stages of the standard-setting process, getting a standard on paper will not be the final phase in the evolution of 10-BaseT.

As a rule, standards are open to a certain amount of interpretation, which can lead to product incompatibilities.

Some vendor or coalition of vendors will have to set the 10-BaseT implementation standard, much like IBM did with its Token-Ring Network. The other vendors will have to comply with the paper standard as well as ensure that their products interoperate with those from the leading suppliers.

Meanwhile, customers buying products that comply with the 10-BaseT draft standard cannot be sure the devices will be interoperable with the implementation

(continued on page 26)

Soderblom will cut Madge off if he wins patent suit

By Laura DiDio
Senior Editor

FRAMINGHAM, Mass. — Olof Soderblom, the inventor who holds U.S. and British patents for token-passing local net technology, said last week he will enjoin Madge Networks, Inc. from using the technology if Madge's pending lawsuit against him fails.

In February, Soderblom sued Madge Networks in San Francisco's Federal District Court, charging the British firm with patent infringement on the grounds that it was manufacturing and shipping token-ring products but had not licensed the technology. Madge Networks countersued, seeking to have the patent invalidated based on the contention that it does not apply to current token-ring technology.

"We'd be happy to reach an out-of-court settlement with Madge," Soderblom said. "But if it goes to trial and Madge loses, I won't let them license my technology." He acknowledged that this would probably put Madge Networks out of business.

Madge Networks, a privately held firm that has annual revenue of about $14 million, said it is convinced it will succeed in overturning Soderblom's patent.

"The lawsuit poses no risk to us since we feel strongly that the Soderblom patent will be found to be not applicable to token-ring technology," said Ed Murray, the firm's director of North American operations. "The chances of Soderblom putting us out of business are nil."

Approximately 50 token-ring vendors, including IBM, have licensed Soderblom's technology, a broad-based token-passing scheme that doesn't specify the speed of the transmission medium. Soderblom said he has collected in excess of $20 million in royalty payments since his patent was granted in 1981.

Soderblom claimed he sued Madge Networks because he must be fair to the other licensees who are paying him royalties.

"I have a great responsibility to treat everyone in an equal and democratic fashion," Soderblom said. "By not paying royalties, Madge is trying to compete unfairly with other token-ring vendors since its costs are lower than rival companies."

Soderblom said he will appeal in the event Madge Networks succeeds in invalidating his patent in federal court.

"If I lose, I'll appeal, but the thought hasn't entered my head that we might lose. This patent has been uniquely challenged in the past; there are very few patents that have been so uniquely tried, tested and challenged," he said. If the patent stands, token-ring and 100M bit/sec Fiber Distributed Data Interface vendors will continue to pay Soderblom royalties until the patent expires in 1999.

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10NET to enhance its SecureLAN encryption product for NetWare

By Laura DiDio
Senior Editor

DAYTON, Ohio — 10NET Communications, based here, is readying new drivers for its existing SecureLAN data encryption software that will enable users to encrypt data on Novell, Inc. NetWare Version 2.15 networks.

10NET's SecureLAN data encryption software, which is based on the federal government's Data Encryption Standard; currently only works with the company's 10NET net operating system software.

The drivers for NetWare are in beta test and are expected to be formally introduced later this month, sources within 10NET said last week.

10NET is a wholly owned subsidiary of Digital Communications Associates, Inc.

Version 2.15 encryption

The release of the new drivers will allow network administrators to encrypt data on NetWare Version 2.15 networks, as well as data stored on file servers and the hard disks of user workstations, the source said.

10NET is targeting SecureLAN for NetWare at government and military markets as well as some commercial sectors such as banking and brokerage houses where data security is of paramount importance, he said.

SecureLAN incorporates a system that lets net administrators restrict user access to specific files, file servers and directories.

Additionally, network administrators can designate specific time periods during which users can access files or directories.

SecureLAN is designed to be used with local-area networks and internetworks built using bridges, routers and bridge/routers.

However, the source emphasized that the forthcoming SecureLAN for NetWare Version 2.15 will not encrypt data that is transmitted to remote LANs because bridges and routers have to be able to read addressing information.

The source said the company is working on SecureLAN enhancements that will allow data packets to remain encrypted for wide-area data transmission. The company is also working on software drivers that will enable SecureLAN to be used on NetWare 386 networks, the source said.

10NET plans to begin shipping SecureLAN drivers for NetWare Version 2.15 within two months.

The drivers will also be included in the company's SecureLAN encryption board and 10NET adapters, which together sell for $1,595. The drivers will work only with 10NET adapters, the source said. ◼

Netnotes

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new low-priced, internal Ethernet adapters for Apple Computer, Inc.'s Macintosh II computers and a version of its standalone Nodem interface based on the IEEE 10BaseT draft standard.

The internal adapters are 32-bit boards that plug into Apple's NuBus. The EtherMac II, priced at $495, supports both thick- and thin-coaxial Ethernet media. The EtherMac II/10T, which lists for $595, is based on the 10BaseT draft standard for running Ethernet over unshielded twisted-pair cable.

The Nodem-10T is an external unit that plugs into the Mac II's built-in Small Computer System Interface (SCSI) port and provides a 10BaseT Ethernet LAN interface. The Nodem-10T costs $595 and is compatible with Farallon Computing's StarController EN.

Adaptec can be reached at 691 S. Milpitas Blvd., Milpitas, Calif. 95035, or call (408) 945-8600.

Panamax last week unveiled an uninterruptible power supply for LANs that protects against power failures, surges, noise and overvoltage. When a power failure occurs, the computer interface on the Powermax 520VA signals the computer and tells it to secure files and initiate an automatic shutdown. This feature is supported by Novell, Inc.'s NetWare and 3Com Corp.'s 3S/400 operating systems.

It can switch to battery power within 2 msec of a power failure and provide backup power for 10 minutes. The Powermax 520VA is available now and costs $599.

For more information, contact Panamax at 150 Mitchell Blvd., San Rafael, Calif. 94903, or call (415) 499-3900.

GUPTA Technologies, Inc. will be holding a series of free seminars around the country this month to familiarize users with its SQLNetwork connectivity software that enables local-area network-based personal computers to access DB2 data bases on IBM mainframes. "PC Connectivity to DB2 Seminars" will include demonstrations of products, including SQLWindows, GUPTA Technologies' application development system for applications running under Microsoft Corp.'s Microsoft Windows. The seminars will be held April 9 in New York, April 11 in Boston, April 12 in Chicago and April 18 in Los Angeles.

Those interested can register for one of the seminars by calling (800) 366-4878. GUPTA Technologies can be reached at 1040 Marsh Road, Suite 200, Menlo Park, Calif. 94025, or call (415) 321-9500. ◼

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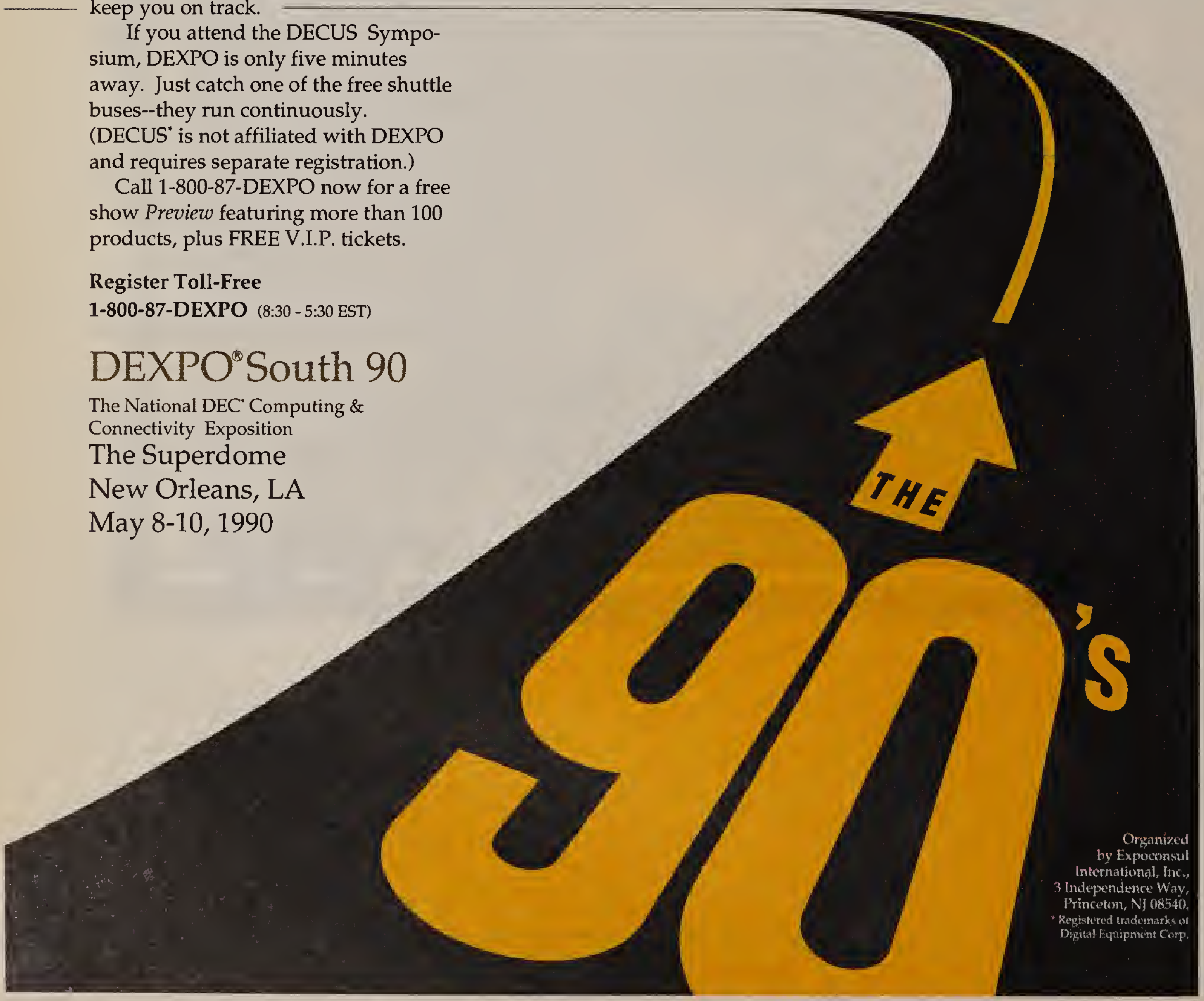

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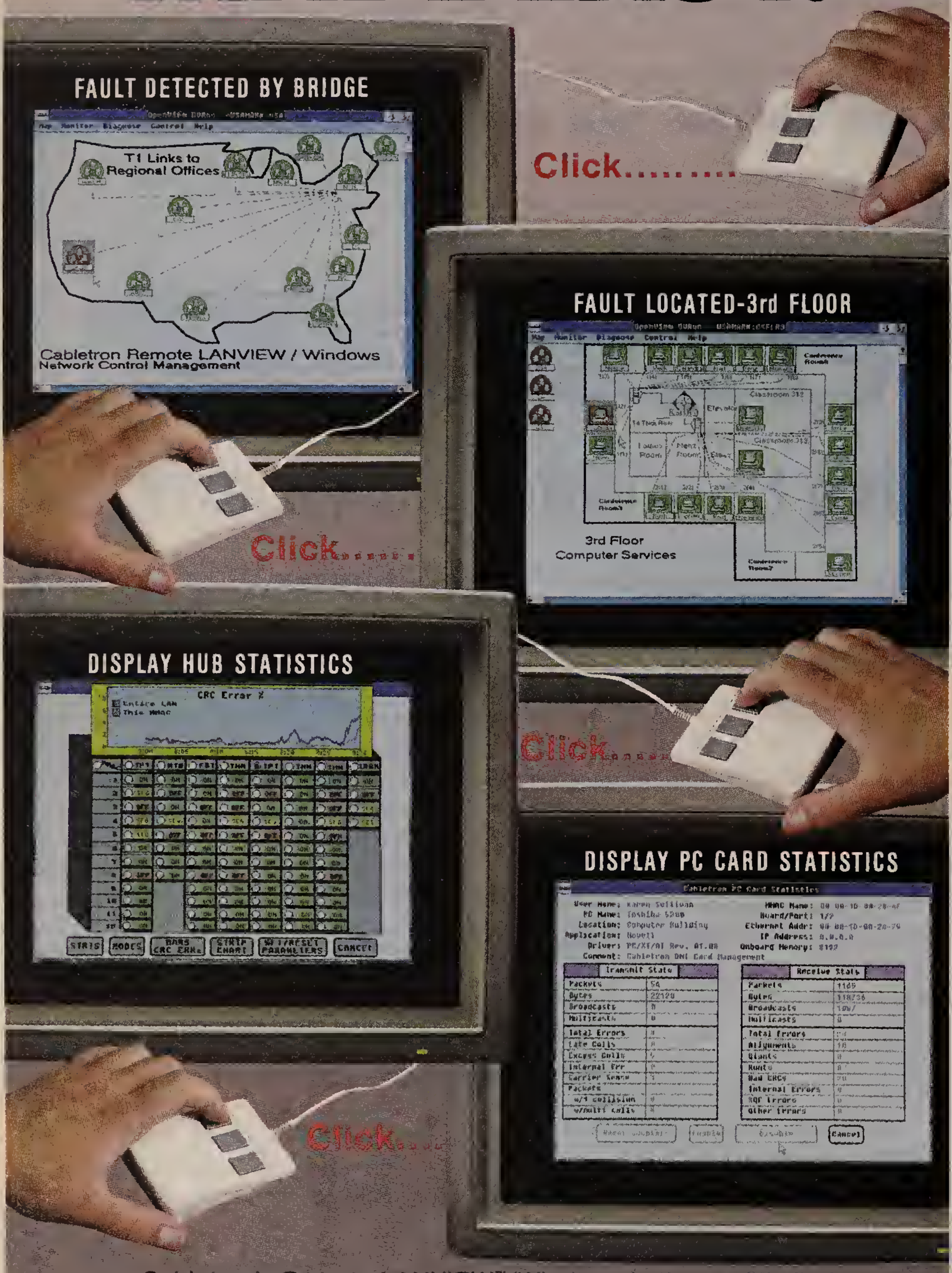

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See the FAXNeT Form on Page #25

10BaseT still needs market leadership

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standard that emerges. Customers that buy products that are not interoperable with the implementation standard may end up being tied to one vendor.

But asking a vendor who it thinks will set the implementation standard is akin to asking a politician who will win an election.

King of the hill

Industry observers say there are a number of vendors that have the opportunity to take charge, not only in the market at large but in certain market niches.

According to Dave Perro, an analyst with market research firm Dataquest, Inc. in San Jose, Calif., AT&T, Cabletron Systems, Inc., David Systems, Inc., Hewlett-Packard Co. and SynOptics Communications, Inc. will have a shot at setting the implementation standard because they offer full systems, as well as service and support.

Although SynOptics has the largest installed base of Ethernet products that use unshielded twisted-pair wire — 390,500 nodes — almost all of its products predate the standard.

But Perro said SynOptics will be able to outpace the other vendors by offering network management systems capable of managing its existing LattisNet products as well as the company's new 10BaseT-compliant products.

SynOptics has the largest installed base of Ethernet products that use unshielded twisted-pair wire.

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Roger Bertman, group director of marketing for Ungermann-Bass, Inc., said he believes leadership in the 10BaseT market will come not from a single vendor, but rather from a consortium of vendors that participate in interoperability tests at the University of New Hampshire (UNH) in Durham.

According to Barry Reinhold, interoperability laboratory manager at UNH, six vendors have joined the consortium and another eight are lined up to take part.

Members of the consortium will perform interoperability tests with other vendors at the lab, which is more efficient than trying to conduct these tests during trade shows.

The current vendors participating in the interoperability lab include BICC Data Networks, Inc., Cabletron, Chipcom Corp., David Systems, Racal InterLan and Ungermann-Bass. "Everybody's got to swim in this together or we'll all sink," Reinhold said.

Analysts and vendors agree that increasing market competition will benefit users in the form of lower prices.

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While the question about who will set the implementation standard is still up in the air, analysts and vendors agree that increasing market competition will benefit users in the form of lower prices, more network management products and increased customer service.

According to International Data Corp. in Framingham, Mass., shipments of Ethernet nodes for unshielded twisted pair are expected to jump from 453,000 in 1989 — before approval of the draft standard — to more than three million in 1994.

Some users, such as Fidelity Investments, are more concerned about long-term customer service and support rather than being able to mix and match vendor products.

Richard Amster, systems manager for Fidelity, a Boston-based company that manages more than $110 billion in mutual funds, said his company bought its 10-BaseT products before the draft standard was approved but will probably stay with one vendor anyway.

Amster said he likes the development of competition because he believes it will ensure better customer support and spark more product innovation.

"The more competition, the lower the cost and the more robust and versatile the product should be," Amster said. Users need "more bells and whistles. One of these areas is network management."

The company has linked 600 nodes using Cabletron's 10BaseT products and expects to support another 1,400 nodes by year end. ◼

DEC X terminal integrates windows

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market participation by big names such as DEC will add credibility to the X Window movement and attract users.

NCD, which has more than a year's head start on X Windows, has about a 60% share of the market, according to Estrin. She figures NCD's share of the market will slip to between 50% and 60%, but that the smaller piece will be of a much bigger pie.

"On one hand, they're a substantial competitor because they're DEC," Estrin said. "But from a product-to-product standpoint, we think we compete very well against them." NCD now offers a color terminal, while DEC's is monochrome, Estrin said.

According to Greg Blatnik, vice-president and director of graphics services for Dataquest, Inc., a market research firm in San Jose, Calif., the increasing number of vendors in the market will pique interest in X Window products.

"The market should begin to expand based on the fact that the major companies are now active," Blatnik said. "We believe people will become more comfortable with the X Window terminal, and we should see a growing number of applications."

The VT1000 with a 15-in. screen is available now for $2,695 each in quantities of 25. The model with a 19-in. screen is priced at $3,395 each in quantity orders, while a version with a 19-in. electroluminescent flat-panel monitor costs $13,395.

The VT1000 terminal screens have a resolution of 1,024 by 864 pixels. ◼

MANAGEMENT STRATEGIES

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Worth Noting

"The downside of distributed systems is that they cost 25% to 30% more to build than centralized systems."

T. Capers Jones
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Research, Inc.
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Association Watch

The **Communications Managers Association** will hold a membership and education meeting April 18 at the New York Marriott Marquis.

Featured speakers will include Fred Haase, director of national sales support for Racal-Milgo; Patricia Kravtin, senior economist at Economics and Technology, Inc.; and Jim Sever, manager of network quality and reliability at Westinghouse Electric Corp.'s Communications Systems Division.

Haase said he plans to profile several companies that use networks for competitive advantage. Kravtin will discuss the New York Telephone Co. rate case now before the New York Public Service Commission, and Sever intends to talk about Westinghouse's approach to network management.

For more information, call (201) 766-3824.

The **Telematics Users Society,** a group of users and resellers of Telematics International, Inc. programmable communications processors, will hold its second annual conference April 29 to May 3 in Deerfield Beach, Fla.

The Fort Lauderdale, Fla.-based group has plans for presentations and educational sessions hosted by international Telematics users, including officers of Switzerland's Post, Telegraph and Telephone administration.

For more information about the Telematics Users Society, call Joe Scarpa at (305) 772-3070.

Used equipment saves the day for users in a pinch

Secondary mart offers option to buying new gear.

By Joe Panepinto
Staff Writer

It's tough selling old solutions to new problems, but that's exactly what vendors of reconditioned equipment do.

Possessing sizable inventories of used equipment, large secondary market companies offer net managers flexible alternatives to renting or leasing from primary vendors. They can be particularly helpful to users that need equipment on short notice.

Last year, Washington, D.C.-based accounting firm Coopers & Lybrand was awarded a large government contract. To handle the contract, the company needed to set up a new office quickly to house 25 people responsible for processing lending information for banks.

"Of course, the normal interval for AT&T to install any mid-range to large [phone] system is six to 16 weeks," said Tom Pizza, telecommunications manager with the company. "So we were behind the eight ball."

Enter Farmstead Telephone Group, Inc., an East Hartford, Conn.-based reseller, renter, lessor and refurbisher of AT&T equipment. While Coopers & Lybrand waited for a new System 75 private branch exchange to be delivered by AT&T, Farmstead installed a used AT&T Merlin key system supporting 25 lines to tide the company over.

"We generally deal with AT&T exclusively for equipment," Pizza said. "But on a short-term basis, you sometimes have to go with a reseller who has the equipment on the shelf."

Similarly, Craig Hall, a telecommunications manager at Continental Insurance Co., had less than a month to relocate a 40-person claims processing office from Spokane, Wash., to Seattle.

Hall originally called Farmstead to help move Continental's AT&T System 75 from Spokane to the Seattle office, which was equipped with an AT&T Dimension PBX that could not accommodate the new users.

But moving the old System 75 would have cost Continental at least two week's downtime, which the company could not af-

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BOOK REVIEW

BY ERIC SCHMALL

Guide to virtual networks hits the mark

Virtual Networks: A Buyer's Guide, Daniel Briere (Boston: Artech House, 1990), $60.

It's rare when a technical author picks a target, takes aim and scores a direct hit. Briere's book on virtual networks delivers all it promises to readers: It offers a coherent, comprehensive review of virtual network technology, and it compares and contrasts the virtual network offerings of AT&T, MCI Communications Corp. and US Sprint Communications Co., as well as the regional Bell holding companies.

The book is an invaluable aid for network professionals who want to learn more about virtual network services or who are evaluating virtual net bids from major carriers. *Virtual Networks* will enable readers to cut through confusing sales lingo and make qualified and informed purchasing decisions.

Briere, who is president of TeleChoice, Inc., a Manchester, Conn., telecommunications consulting firm, structures the book around examinations of different virtual network components, such as dedicated access methods. He then compares the offerings of AT&T, MCI, and US Sprint for each component. His descriptions are objective and insightful.

Briere also outlines progress made in the intra-local access and transport area market. He describes virtual network offerings from New England Telephone and Telegraph Co., New

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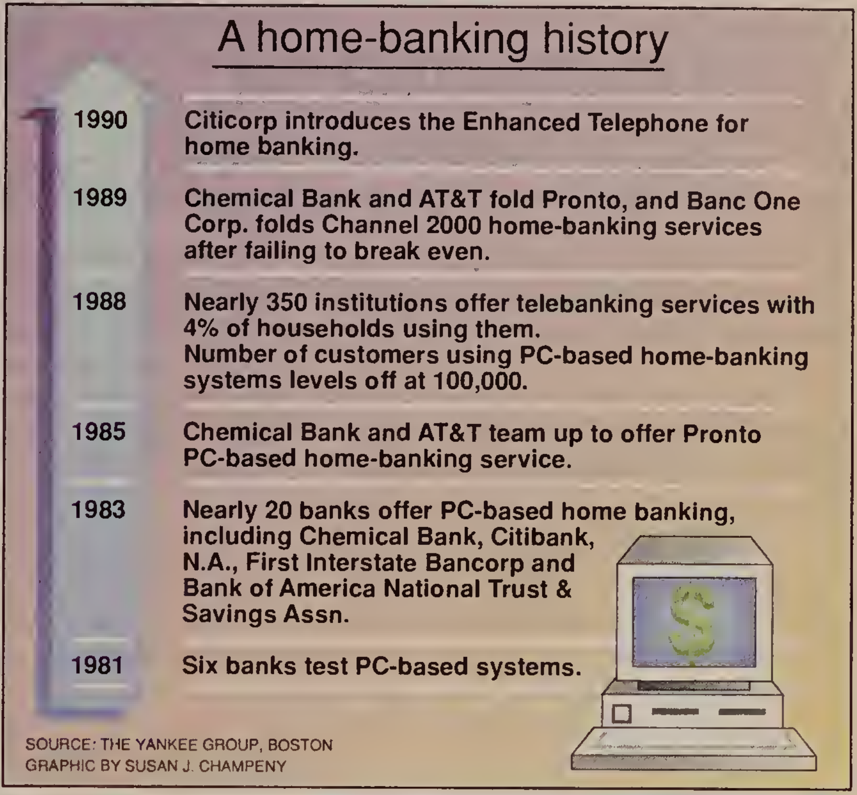
Schmall is a network systems manager for an insurance holding company.



A home-banking history

1990	Citicorp introduces the Enhanced Telephone for home banking.
1989	Chemical Bank and AT&T fold Pronto, and Banc One Corp. folds Channel 2000 home-banking services after failing to break even.
1988	Nearly 350 institutions offer telebanking services with 4% of households using them. Number of customers using PC-based home-banking systems levels off at 100,000.
1985	Chemical Bank and AT&T team up to offer Pronto PC-based home-banking service.
1983	Nearly 20 banks offer PC-based home banking, including Chemical Bank, Citibank, N.A., First Interstate Bancorp and Bank of America National Trust & Savings Assn.
1981	Six banks test PC-based systems.

SOURCE: THE YANKEE GROUP, BOSTON
GRAPHIC BY SUSAN J. CHAMPENY

Banks backing off from home banking

Some pioneers dismantle PC-based systems in favor of new tools designed to win customers.

By Joe Panepinto
Staff Writer

Some of the leading proponents of home banking in the 1980s have dismantled their personal computer-based services, cutting their losses on systems that were too expensive to maintain in light of the relatively few customers they attracted.

Analysts estimate that fewer than 100,000 people nationwide are regular users of the personal computer-based bank-at-home services offered directly by individual banks.

Today, many banks are diverting resources into other tools such as telebanking and voice response systems in the hopes of getting what personal computer-based home-banking services failed to deliver: masses of new customers hooked on value-added services such as electronic funds transfer and automatic bill and loan payment.

"Conceptually, home-banking sounded great," said Richard Bove, a bank analyst and first vice-president at Dean Witter Reynolds, Inc. "But there was a great deal of skepticism on the part of consumers that this was going to be good for them. So it died."

Out with the old

John Russell, vice-president and director of corporate communications at Columbus, Ohio-based Banc One Corp., said his bank scrapped its personal computer-based home-banking service and is now offering home-banking through the Prodigy information service offered by the IBM and Sears, Roebuck and Co. subsidiary Prodigy Services Co.

Russell said despite Banc One's size — it has $38 billion in assets and more than 750 branches in six states — it couldn't get enough customers to justify the cost of operating its own personal computer-based service. He said he is hoping the bank will meet with greater success with Prodigy's huge installed base of users.

"Each bank that sets up its own on-line services would have to go out and recruit its own PC-owner customers," said Tom Ponosuk, program manager of banking services at White Plains, N.Y.-based Prodigy Services. "With Prodigy, they have the customers already."

Prodigy offers about 800 on-line services to more than 300,000 subscribers, including home-banking services from 14 institutions around the country, such as Banc One, Bank of New England Corp., Manufacturers Hanover Corp. and Wells Fargo & Co.

Russell said Banc One tried two home-banking projects on its own in the early 1980s and abandoned both before the end of the decade. Channel 2000 was a trial personal computer-based home-banking system available to about 200 customers that was well received. However, Applause, a personal computer-based home-banking system modeled after Channel 2000, at-

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Used equipment saves day for users

continued from page 27

ford. So Hall found a solution through the secondary market.

Alex Capo, vice-president of marketing and sales at Farmstead, offered to immediately install in Seattle an AT&T System 75 PBX from Farmstead's stock that would meet the demands of the newly enlarged office.

When Continental was ready to cut over operations from Spokane to Seattle, the telephone system already would be in place.

In return, Farmstead would get the old System 75, roughly five weeks' rent and the difference in value between the system it installed and Continental's old system.

Newfound respect

User interest in adopting secondary market equipment has been rekindled by the recent thaw in relations between primary and used equipment vendors, according to George Taylor, chairman and chief executive officer of Farmstead, speaking at a recent gathering of the Communications Managers Association in New York.

AT&T last year began a used equipment certification and service program. In November, Northern Telecom, Inc. for the first time recognized the secondary market for its equipment, although it has not yet extended the same service and equipment certification AT&T has.

Such arrangements have eased network manager concerns about used product quality and service.

But some network managers dismiss the secondary market out of hand, saying they would rather deal with vendors directly.

One telecommunications manager from a large company who asked not to be identified ordered an automatic call distributor component from a secondary market company while waiting for a new AT&T Digital Recorded Announcement card to arrive.

"It was a nightmare," he said, recounting the rounds of finger-pointing that went on between the reseller and AT&T over who was to install and service the card. "I'll never do it again." ◘

Datacomm Commentary

"When it's 'data to go,' we order UDS modems"

Today's fast food business is also a fast data business. Sales and profit figures, inventory controls, expense reporting, wage and benefit information, tax computations and other essential data must flow quickly and reliably between individual stores and corporate headquarters.

That's why the implementation of Wendy's new corporate-wide datacomm system demanded the utmost in modem reliability. And **that's** why Wendy's chose UDS as their modem supplier.

Wendy's modems of choice are the UDS Sync-Up™ V.32 and Sync-Up 2/V.32. They connect Wendy's remotely sited microcomputers with the corporate mainframe. Collectively they give Wendy's a full-duplex, 9600 bps data link to every company location, no matter how remote. UDS provides maximum reliability, ongoing customer support and a virtually error free communications environment.

Information Systems Group,
Wendy's International

If your modem requirements are too critical for compromises, do as Wendy's has done: contact UDS, 5000 Bradford Drive, Huntsville, AL 35805-1993. Phone 205/430-8000; FAX: 205/430-8926.

UDS
MOTOROLA

See the FAXNeT Form on Page #25

Banks backing off from home banking

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tracted fewer than 1,000 subscribers.

"The systems worked great," Russell said. "Except we could never get to the critical mass of about 5,000 users that would let us break even. All the banks found that it would be very difficult for any one bank to generate enough customers to make a home-banking system pay for itself."

Chemical Bank Corp. is another personal computer home-banking pioneer that recently scrapped its homegrown system.

Chemical introduced its Pronto home-banking services for individuals and Pronto Business Banker for small businesses in 1983. Two years later, Chemical teamed up with AT&T in a joint venture meant to push the product through the second half of the decade. Despite the muscle of the two home-banking partners, Pronto failed to attract enough customers to break even and was abandoned last year, according to a Chemical spokesman.

At the time Pronto was introduced, voice response systems were not yet widely available and automated teller machines were not extensively networked. Many analysts agreed that the emergence of both of those convenience-enhancing technologies hastened the end of home banking at Chemical.

Chemical customers can now do everything over the telephone or with the help of third-party vendors that offer automatic bill paying through Chemical that they could do with Pronto.

Citicorp tests the waters

Citicorp, which has also had a difficult time selling its personal computer-based home-banking system dubbed Direct Access, last month released the Enhanced Telephone (ET) in an effort to jump start the stalled home-banking market.

The ET device looks like a bloated telephone with an 18-line screen display embedded between the keypad and headset and a tiny retractable keyboard that is stored underneath the unit. It was designed to be easier to use and less intimidating than a personal computer.

Through the ET device, Citicorp will offer the same services available on most personal computer-based systems, including automatic bill payment, account information and loan application. ◘

Guide to virtual nets hits the mark

continued from page 27

York Telephone Co. and Pacific Bell. The author gives a clear account of the fierce competition among AT&T, MCI and US Sprint in forging international virtual networks. He concludes his work with a thoughtful analysis on how the major players will fare in the coming years.

The appendixes include a handy summary of virtual network features and how major carriers implement them. Briere also includes a 35-page glossary of terms excerpted from Herb Kirchhoff's *A Quick Guide to the New Telecom Lingo* (Alexandria, Va.: Telecom Publishing Group).

Virtual Networks offers readers an objective analysis of virtual network technology and carrier product offerings. It is a must read for any manager considering implementing a virtual net or wishing to learn more about these systems. ◘

Worth Noting

Japan's dominant international carrier, Kokusai Denshin Denwa, Ltd., recently announced plans to cut over an undersea fiber-optic cable linking Japan and Taiwan in 1993. The cable, expected to cost about $80 million to construct, will support up to 7,560 64K bit/sec circuits.

World News

British Telecommunications PLC recently announced a major restructuring and the departure of its managing director, Graeme Odgers.

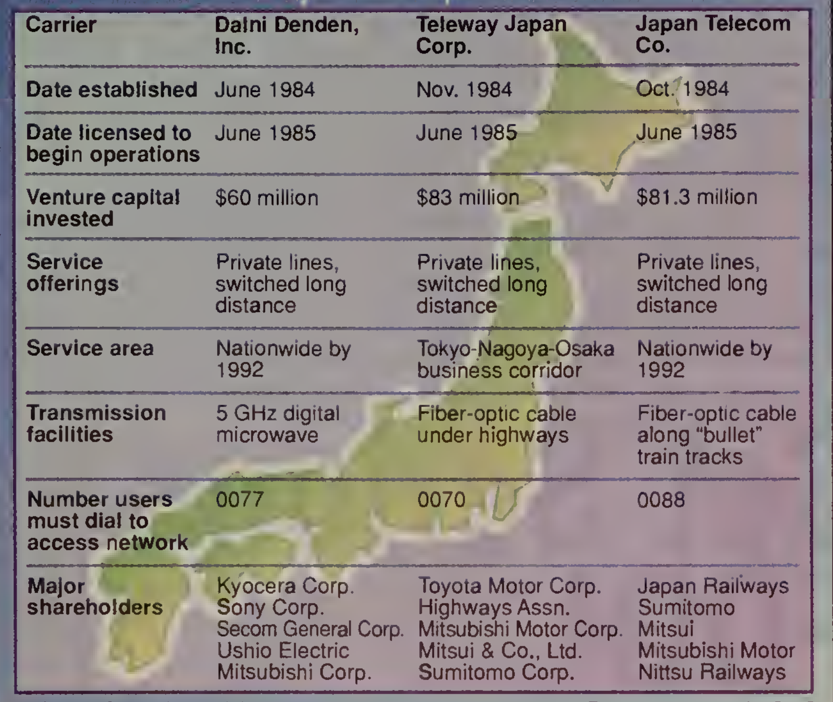
Under the terms of the reorganization, by April 1991, British Telecom will essentially disband its separate U.K. and international communications divisions and reorganize them into separate units focused on business and personal communications.

British Telecom is touting the reorganization as a way of enabling it to serve customers better by having all the services relevant to different users managed under a single umbrella rather than split into different groups. The reorganization should also enable the firm to reduce its management ranks by between 2,000 and 4,000 employees.

Although the company stated that the departure of Odgers was unrelated to the restructuring in a prepared statement, many analysts disagreed, saying the manager lost power and most likely was forced to leave.

The **France Telecom Users Group** recently announced it will hold its first meeting of 1990 during the International Communications Association's annual conference and exhibition in New Orleans on May 24.

Nippon Telegraph and Telephone Corp.'s major competitors



Carrier	Daini Denden, Inc.	Teleway Japan Corp.	Japan Telecom Co.
Date established	June 1984	Nov. 1984	Oct. 1984
Date licensed to begin operations	June 1985	June 1985	June 1985
Venture capital invested	$60 million	$83 million	$81.3 million
Service offerings	Private lines, switched long distance	Private lines, switched long distance	Private lines, switched long distance
Service area	Nationwide by 1992	Tokyo-Nagoya-Osaka business corridor	Nationwide by 1992
Transmission facilities	5 GHz digital microwave	Fiber-optic cable under highways	Fiber-optic cable along "bullet" train tracks
Number users must dial to access network	0077	0070	0088
Major shareholders	Kyocera Corp. Sony Corp. Secom General Corp. Ushio Electric Mitsubishi Corp.	Toyota Motor Corp. Highways Assn. Mitsubishi Motor Corp. Mitsui & Co., Ltd. Sumitomo Corp.	Japan Railways Sumitomo Mitsui Mitsubishi Motor Nittsu Railways

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: TELEWAY JAPAN CORP., TOKYO

Rivals face uphill climb even if NTT is broken up

Business ties a big edge for dominant carrier.

By Lori Valigra
IDG News Service Asian Bureau

TOKYO — Even if Japan's huge domestic carrier Nippon Telegraph and Telephone Corp. (NTT) is eventually forced into divestiture, upstart competitors are likely to face tough going.

According to analysts and carrier officials, separate units spun off from NTT would still be enormous and would retain business ties that give them an edge over domestic competitors.

"NTT has been a monopoly for a long period," said Hiroshi Ohno, senior industry analyst for telecommunications at Dataquest, Inc.'s Japanese subsidiary. "Even after it's [divested], it will stay strong because of its existing personal and business relationships."

NTT, the world's largest publicly held company, retains close relationships with several Japanese corporations that newer and smaller competitors cannot yet match.

"[Large Japanese insurance companies] use NTT because NTT is a big insurance company customer," said Mitsuo Godoh, managing director of Teleway Japan Corp., citing just one example of customers that will favor the carrier because of long-standing business ties.

Despite these problems, NTT's three biggest competitors in the private-line and switched long-distance markets — Teleway Japan, Daini Denden, Inc. and Japan Telecom Co., all based here — are heating up the rhetoric in the campaign to get NTT divested.

"We feel we have a very big handicap with NTT unless it is divided into two or more companies," Godoh said.

Haruo Taneno, director of Daini Denden, added that "until NTT is broken into long-distance and local companies, we are not even."

Currently, NTT's three major competitors have approximately a 6% share of the $20 billion Japanese switched long-distance market. Of this, Daini Denden controls 50%, followed by Japan Telecom with 30% to 35% and Teleway Japan with the remainder. The carriers offer switched long-distance services at rates averaging about 15% less than NTT's prices. They also offer private-line services at similar discounts compared to NTT ("NTT cuts private-line and long-haul rates," *NW,* April 2).

The alternative carriers' service areas are concentrated along the Tokyo-Nagoya-Osaka business corridor, although Daini Denden and Japan Telecom plan to offer nationwide coverage by 1992.

Coming to a head

The divestiture issue came to a head last month when the Telecommunications Council, a major advisory arm to Japan's Ministry of Posts and Telecommunications, recommended that NTT be split up into separate long-distance, local and mobile communications carriers in the mid- to late 1990s.

Recently, however, the Japanese government backpedaled somewhat from that recommendation by saying it would wait at

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U.S., Japan hammer out fax, CPE pacts

Agreements should ease facsimile transmission between countries, loosen CPE ownership rules.

By Barton Crockett
Senior Editor

WASHINGTON, D.C. — The U.S. government is close to concluding a series of agreements with Japan that would make it easier for international carriers to provide facsimile services into that country and enable users there to own certain kinds of customer premises equipment.

The agreements, which have been at the center of a long-standing trade dispute between the two countries, will reduce the cost of enhanced fax services between the U.S. and Japan, and give users greater control over private networks by eliminating the need to rely on Nippon Telegraph and Telephone Corp. (NTT) to supply some customer premises equipment.

The fax agreement would enable international value-added networks (VAN) to carry fax traffic into Japan over dedicated circuits rather than separate dial-up facilities as is currently required. This would allow the networks to carry fax traffic over the same lines used to provide other services, resulting in savings that can be passed on to users.

The rule change will also benefit users by making it economical for more international VANs to begin supporting enhanced fax services into Japan.

On the equipment side, the agreements would end NTT's monopoly ownership of data service units (DSU), channel service units (CSU) and some Integrated Services Digital Network customer premises equipment.

The move would give users more control over private networks by enabling customers, rather than the carrier, to choose the type of equipment used.

"At this stage, I'm very optimistic that some favorable agreements will be concluded," a senior U.S. official involved in the negotiations said privately. "Those agreements should bene-

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PERSPECTIVES
BY STEVE PATTERSON

The 1990s will be the decade of the global net

In the decade ahead, network managers will need to accommodate two trends reshaping business.

The first is that markets are becoming more global as major corporations seek to derive 60% to 70% of their revenue abroad. The other is that companies are flattening organizational pyramids in order to cut costs and respond more nimbly to changing market conditions.

Both of these developments mean that in the 1990s, users will depend on global networks more than ever before. Users will need these facilities to tie together far-flung managers laboring in a leaner, more demanding corporate environment.

The problem is that while network managers and their firms are busy extending their global reach, many of the communications vendors they rely on are not.

"With the exception of IBM, not many vendors have a global presence," says Jeff Marshall, managing director of communications at the New York investment firm Bear, Stearns & Co., Inc.

Because of this lack of global prescence, it is vital that users closely examine the level of international support a vendor can provide. Users need to be sure that their preferred vendor has enough qualified employees in international locations or partnership arrangements with foreign firms to support networks spanning several countries.

There are basically two obstacles that keep network equip-

(continued on page 30)

Patterson is a Boston-based consultant, free-lance journalist and a founder of Banyan Systems, Inc. in Westborough, Mass.

U.S., Japan hammer out fax, CPE pacts

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fit users by giving them more freedom to implement the net solutions they want."

The U.S. government has been pressuring Japan to make these changes for years under the belief that they represent unfair barriers to trade. U.S. negotiators said that lifting international VAN restrictions will make it easier for U.S. service providers to enter that market. They added that U.S. vendors should have more success marketing customer premises equipment directly to users rather than to NTT.

The issue came to a head in March 1989, when the U.S. designated Japan as an "unfair trader" and threatened retaliatory actions, including stiff tariffs on Japanese network equipment and services, unless favorable changes were made in these and other areas within one year.

According to U.S. officials involved in the negotiations, late last month, Japanese negotiators sent their U.S. counterparts a letter agreeing "in principle" to liberalize restrictions on ownership of customer premises equipment. The Japanese government pledged to work over the next 120 days to implement new regulations that would enable users, rather than NTT, to own DSUs, CSUs and some ISDN customer premises equipment.

Japanese negotiators also indicated that they will work to drop regulations barring the transmission of fax services over leased lines operated by international VANs, U.S. officials said.

Because of these moves and favorable developments in other markets, the U.S. has agreed to give Japan another 120 days before deciding whether or not to declare the country an unfair trader. If the Japanese reforms are implemented as promised, the dispute will be resolved.

The settlement of these disagreements should significantly reduce tensions in what has been a long history of trade disputes between the U.S. and Japan over network services and equipment.

With the latest problems nearing settlement, U.S. officials indicated that relations with Japan in the net services and equipment trade arena could improve, but they emphasized that the U.S. will continue to work to get Japan to drop barriers. ◘

NTT rivals face uphill climb

continued from page 29

least five years before deciding whether NTT should be divested.

This means that any breakup of NTT would probably happen after the dates recommended by the Telecommunications Council — 1995 for a separate long-distance company and 1997 for separate mobile communications and local carriers — if the divestiture occurs at all.

One of the biggest barriers to competition, according to rivals, is that NTT retains a monopoly over local service. This means that competitors to NTT in the long-distance market must use NTT facilities to access subscribers in the local loop.

NTT's competitors say the carrier exploits this difference by not offering equal access arrangements. They complain that users of long-distance services must dial anywhere from four to 30 extra digits to access alternative networks — something with which NTT's long-distance customers don't have to deal. "Our big disadvantage is dialing four extra digits," Taneno said. "[That makes it] hard to convince people to use our service." ◘

The 1990s will be the decade of global net

continued from page 29

ment vendors from acquiring the same global presence as their U.S. customers. The first is that the enormous size of the U.S. market distracts small but rapidly growing vendors from exploiting opportunities abroad. The second is that in order to compete internationally, vendors must accommodate disparate network standards and government regulations. Many vendors don't have the resources to do this effectively.

With this in mind, Marshall recommends that users consider several criteria when evaluating a supplier's global presence.

These include competency in the local language, a full understanding of local technologies and the ability to quickly supply replacement parts when equipment breaks down.

When building a global network for his firm nearly two years ago, Marshall examined on a city-by-city basis how competent his preferred vendor's support was and laid out in detail how, and in what time frame, the vendor would respond to service requests.

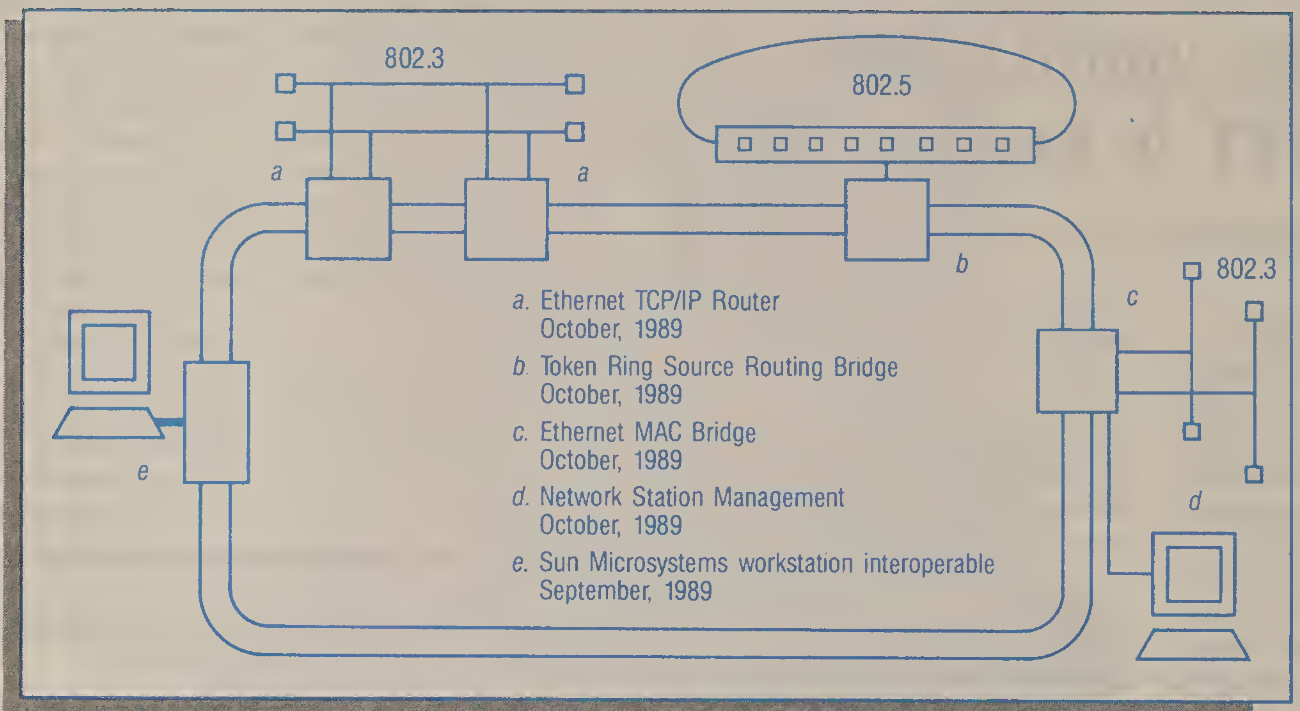
Chris Down, a consulting systems engineer at San Francisco-based BankAmerica Corp., said his firm went even further by specifying a detailed procedure for handling network service problems with its primary vendor, Newbridge Networks Corp.

The procedure called for problems picked up by BankAmerica's network control centers in California, Asia and Europe, which work on separate eight-hour shifts covering the entire day, to be relayed to Newbridge's East Coast support center.

Newbridge, in turn, dispatches local support personnel to resolve problems. By writing these conditions into a service contract, Down said he avoids misunderstandings about how network problems are supposed to be resolved.

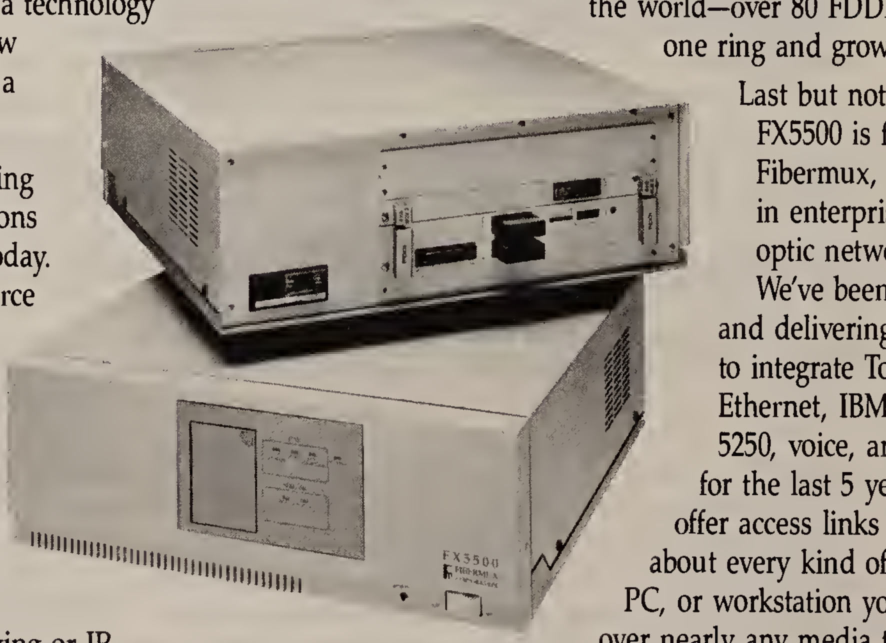
Down added that the bank encourages effective support by specifying performance goals in contracts and giving vendors incentives for exceeding them. ◘

It's Time To Get Serious About FDDI.


802.3
802.5
a
a
b
c
d
e
802.3
a. Ethernet TCP/IP Router
October, 1989
b. Token Ring Source Routing Bridge
October, 1989
c. Ethernet MAC Bridge
October, 1989
d. Network Station Management
October, 1989
e. Sun Microsystems workstation interoperable
September, 1989

Fibermux thinks it's time you looked seriously at FDDI. First, critical components of the standard are finally complete. That means we've been able to engineer our new FX5500 Series to be fully FDDI-compliant. So a technology investment made now won't be obsolete in a few months.

Second, we're shipping the kind of applications you can really use today. Our Token Ring Source Routing Bridge is designed in strict accordance with IBM specifications for easy setup and LAN Manager use. Choose the multi-port Ethernet access unit, providing bridging or IP routing, to build large 802.3 backbones with ease. Our technology has demonstrated capability with Sun Microsystems, Inc.'s new SunNet FDDI/DX controllers (workstation interfaces). In fact, the Native Framing approach we use for LAN packet conversion (as opposed to "frame encapsulation") holds greater promise for future interoperability. And our equipment has been proven successful in one of the largest such networks in the world—over 80 FDDI nodes in one ring and growing.



Last but not least, the FX5500 is from Fibermux, the leader in enterprise fiber-optic networking. We've been designing and delivering systems to integrate Token Ring, Ethernet, IBM 3270 and 5250, voice, and video for the last 5 years. We offer access links to just about every kind of host, PC, or workstation you've got, over nearly any media type. That's enterprise networking experience you can count on.

So if you think it's time to look at FDDI, get serious. With Fibermux's new FX5500 Series. Call (818) 709-6000 or fax (818) 709-1556 today.

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See the FAXNeT Form on Page #25

PRODUCTS & SERVICES

THE LATEST OFFERINGS FROM VENDORS AND CARRIERS

First Look

Cisco adds LAT support to TCP/IP terminal servers

Cisco Systems, Inc. recently added support for Digital Equipment Corp.'s Local Area Transport (LAT) protocol to its terminal servers. The servers previously supported only Transmission Control Protocol/Internet Protocol.

Support for LAT on the ASM and MSM servers means they can now simultaneously link asynchronous terminals, printers or personal computers emulating terminals over X.25 links to hosts running LAT and TCP/IP.

The ASM and MSM servers can establish terminal-to-host connections using any one of four methods: via LAT for the majority of VMS-based DEC hosts or via rlogin, Telnet or Serial Line Interface Protocol for Unix- or DEC Ultrix-based hosts.

LAT protocol support costs $480 for MSM servers and $960 for ASM servers.

cisco Systems, Inc., 1525 O'Brien Drive, Menlo Park, Calif. 94025; (415) 326-1941.

CASE/Datatel rounds out Rixon modem line

CASE/Datatel, Inc. recently added 2,400 and 9.6K bit/sec models to its Rixon DCM4200 family of modems.

The new **Rixon DCM4222** and **Rixon DCM4296** round out the existing product line, which previously supported speeds ranging from 300 to 4.8K bit/sec.

The DCM4222 is a full-duplex modem for use on dial-up or leased lines. It is compatible with CCITT V.21 for 300 bit/sec operation; V.22 for 1,200 bit/sec; V.22bis for 2,400 bit/sec; and Bell 103 and 212 standards for 300 and 1,200 bit/sec operation.

The DCM4296 is a 9.6K bit/sec modem that supports CCITT V.29 for use on synchronous leased lines.

The DCM4222 costs $599 for a tabletop model and $549 for a rack-mounted model; DCM4296 versions are $1,395 and $1,375, respectively. Both are available two to four weeks after receipt of order.

CASE/Datatel, Inc., 9020 Junction Drive, Annapolis Junction, Md. 20701; (800) 227-3134. ☒

3Com introduces 10BaseT adapter, repeater module

Announces extension of OEM pact with Wang.

By Walter Sweet
West Coast Correspondent

SANTA CLARA, Calif. — 3Com Corp. recently unveiled a workstation adapter and twisted-pair module for its MultiConnect Multiport Repeater that support the IEEE 10BaseT draft standard for running Ethernet over unshielded twisted-pair wiring.

In a related announcement, 3Com and Wang Laboratories, Inc. said they have extended an OEM agreement under which Wang will resell 3Com's 10-BaseT-compliant network adapters for connecting desktop computers to twisted-pair wiring systems.

3Com announced an Ethernet network adapter for IBM's Micro Channel Architecture (MCA) and a twisted-pair module for its own MultiConnect Multiport Repeater.

In addition to meeting the IEEE's 10BaseT draft standard, 3Com said its adapters are compatible with pre-standard hubs manufactured by AT&T, David Systems, Inc., Hewlett-Packard Co. and SynOptics Communications, Inc.

The new EtherLink/MC TP adapter is a 16-bit adapter that supports MCA on the Personal System/2 Models 50 through 80. 3Com previously offered a twisted-pair adapter for MCA-based microcomputers, but that product did not support the emerging 10BaseT standard.

The MultiConnect TP Module for 3Com's MultiConnect repeater plugs into one of its 15 slots to link three workstations over twisted-pair wiring to the hub. The system can support up to 45 connections to twisted-pair wiring in one MultiConnect chassis, accommodating up to 1,024 connections through multiple repeaters.

The MultiConnect TP Module can be plugged into the same hub with existing MultiConnect modules. Collectively, they can support thick and thin coaxial cable, shielded and unshielded twisted-pair wiring, IBM Token Ring Network cabling, as well as fiber-optic media.

Using these products in a star topology gives each workstation a direct link to the wiring closet,

(continued on page 34)

Gateway allows dissimilar LANs to exchange data

By Tom Smith
New Products Editor

MARLBOROUGH, Mass. — CrossComm Corp. recently announced a gateway that enables Ethernet, token-ring and Starlan users to communicate over wide-area networks or across Ethernet backbones.

CrossComm's new ILAN-H is a stand-alone unit that sits between local-area networks or between LANs and WANs. The ILAN-H is the first product that can connect Ethernet, token-ring and Starlan nets together over a WAN, although other vendors previously offered local Ethernet-to-token-ring bridges, according to Tad Witkowicz, president of CrossComm.

Witkowicz classified the new ILAN-H as a gateway because it converts token-ring and Starlan data headers into Ethernet format for transmission over a local Ethernet backbone.

ILAN-H can perform this conversion for IBM Token-Ring LANs supporting the IEEE 802.2 Logical Link Control (LLC) protocol, as well as for LANs supporting Transmission Control Protocol/Internet Protocol and Novell, Inc.'s NetWare Integrated Packet Exchange (IPX) protocol.

In remote configurations, ILAN-H encapsulates LLC, TCP/IP or IPX protocols in High-Level Data Link Control format for transmission over dial-up or leased lines.

ILAN-H uses the same hardware as earlier ILAN bridges but has been upgraded with new software that supports communications between dissimilar LANs.

The unit has four slots that can house any combination of LAN or WAN adapter boards.

LAN interfaces available for ILAN-H include Ethernet, token ring and Starlan. Wide-area modules are offered for connection to 56K bit/sec, fractional T-1 and T-1 lines.

Although ILAN-H performs some functions analogous to bridges and routers, it cannot be classified as either.

ILAN-H is not a bridge because it operates above the OSI model's media access control layer and

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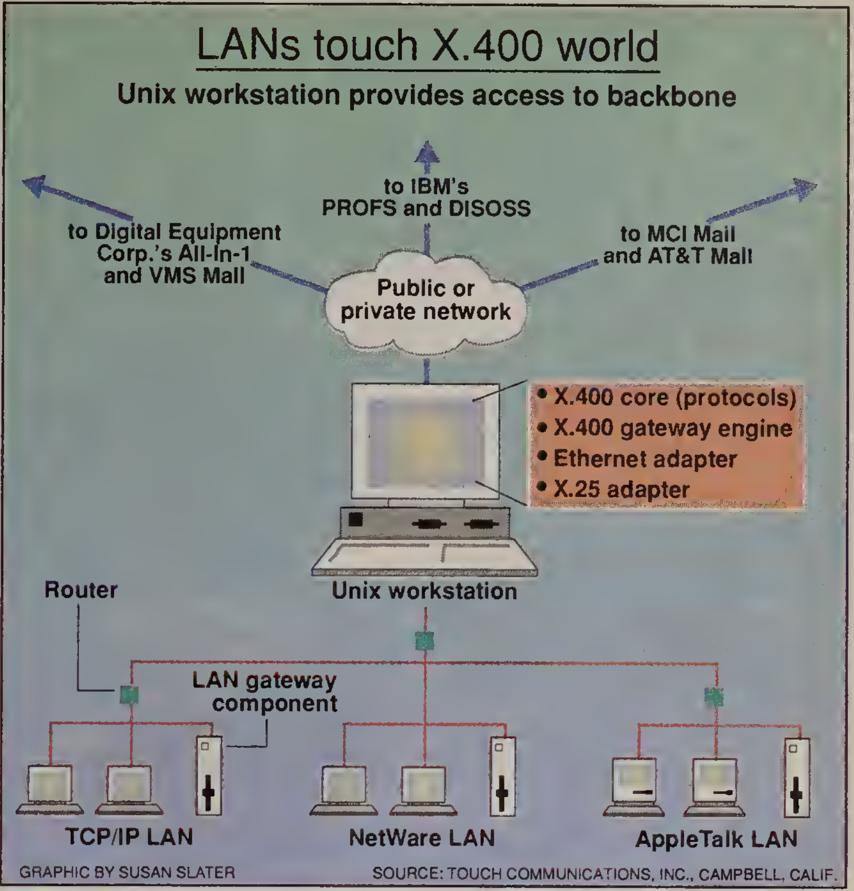


LANs touch X.400 world

Unix workstation provides access to backbone

GRAPHIC BY SUSAN SLATER

SOURCE: TOUCH COMMUNICATIONS, INC., CAMPBELL, CALIF.

Touch unveils X.400 gateways for LANs

Product line allows AppleTalk, NetWare, TCP/IP networks to send and receive X.400 messages.

By Tom Smith
New Products Editor

CAMPBELL, Calif. — Touch Communications, Inc. recently introduced X.400 gateways that enable users of popular LAN-based electronic mail software to exchange messages with corporate or public E-mail nets that also support the X.400 protocol.

The company's WorldTalk/400 software line is targeted at users that need to link incompatible E-mail systems into a corporatewide messaging network or need to extend a company's E-mail ties to suppliers or customers with different messaging nets, according to Chris Moore, product marketing manager.

WorldTalk/400 software enables E-mail users on Apple Computer, Inc. AppleTalk, Novell, Inc. NetWare and Transmission Control Protocol/Internet Protocol local-area networks to access public messaging nets such as AT&T's AT&T Mail and MCI Communications Corp.'s MCI Mail. It also establishes ties to host-based mail systems such as IBM's Professional Office System and Digital Equipment Corp.'s All-In-1.

Initially, Touch will provide X.400 gateways for Action Technologies, Inc.'s Message Handling Service (MHS); cc: Mail, Inc.'s cc:Mail; CE Software's QuickMail; Microsoft Corp.'s Microsoft Mail; The TOPS Division of Sun Microsystems, Inc.'s InBox Plus; and mail nets supporting the Unix Simple Mail Transfer Protocol (SMTP) and Unix-to-Unix Copy Program (UUCP).

By year end, Touch will introduce six additional gateways, Moore said, although the only planned gateway he would disclose is for the OS/2-based Lotus Development Corp. Notes package.

Touch has divided the X.400 gateway into two components: a gateway engine that resides on a Unix-based workstation and specific LAN gateway modules that reside on a LAN server or dedicated mail server running proprietary E-mail software.

The gateway engine establishes connections to public or private X.400 backbones. The LAN gateway component performs address mapping so a message and its destination address is converted from a proprietary E-mail

(continued on page 34)

Gateways galore

Touch's gateways will provide links between X.400 backbones and

- **Action Technologies, Inc.'s MHS**
- **cc:Mail, Inc.'s cc:Mail**
- **CE Software's QuickMail**
- **Microsoft Corp.'s Microsoft Mail**
- **The TOPS Division of Sun Microsystems, Inc.'s InBox Plus**
- **Unix nets supporting Simple Mail Transfer Protocol and Unix-to-Unix Copy Program**

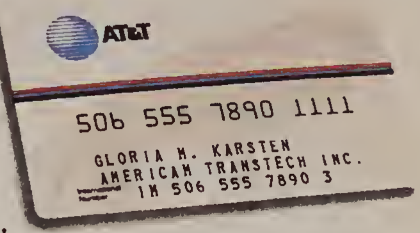
SOURCE: TOUCH COMMUNICATIONS, INC., CAMPBELL, CALIF.
GRAPHIC BY SUSAN SLATER

© 1990 AT&T

Instead of spending your time fishing through your calling card charges, now you can spend your time fishing.

Introducing AT&T Card EXECU-BILL℠ service. A flexible new billing service that gives you a more efficient way of tracking and managing your AT&T Card usage.

With AT&T Card EXECU-BILL service, you can tailor your billing to suit the way your company works. For example, you can specify which departments and individuals get bills or reports and what information you want them to have. You can even get special reports to summarize charges or flag heavy card usage.



What's more, you get a variety of monthly management reports that help you administer your corporate card program, analyze charges and identify abuse.

AT&T Card EXECU-BILL service also comes with options such as usage data on magnetic tape and custom card design. You choose how and where you want your cards distributed and can easily add or deactivate cards.

But that's not all.

With EXECU-BILL service, you're sure you're getting AT&T, the most reliable network in the world. Plus, of course, the ease and convenience of the AT&T Card. And you're guaranteed AT&T's consistent low prices with no surprises.

All of which means with AT&T Card EXECU-BILL service, you'll have better control over your calling card expenses. Not to mention how you spend your time.

For more information, call your AT&T Account Executive or 1 800 222-0400.

AT&T
The right choice.

FileNet ports image wares to LANs, PCs

By Tom Smith
New Products Editor

COSTA MESA, Calif. — FileNet Corp. recently ported its proprietary imaging applications to run on IBM and Compaq Computer Corp. microcomputers attached to local-area networks running Novell, Inc.'s NetWare.

The software upgrades will free users from having to purchase proprietary FileNet workstations, allow them to put imaging abilities on an existing LAN and give access to more third-party software applications.

Until now, the software ran solely on FileNet's own imaging workstations attached to an Ethernet running the firm's proprietary operating system. Support for industry-standard workstations means that for the first time, the FileNet software can also be used on a token-ring net.

The revised software, dubbed Open Workflo Architecture, also enables users for the first time to integrate third-party software, such as word processing or spreadsheet programs, into their imaging applications.

The Open WorkFlo Architecture software runs on networked FileNet System 1100, System 1500, System 3100 and System 3500 servers, which support from 16 to 1,000 workstations.

The company's previous software release, WorkFlo, ran only on Unix workstations manufactured by FileNet, said Robert Castle, the firm's vice-president of marketing. The workstations were dedicated to imaging functions such as retrieval and display.

In the past, WorkFlo enabled other hardware platforms including Personal System/2s to access images from the FileNet server, but users had to develop their own applications using a library of subroutines from FileNet.

Because FileNet has now ported application software for tasks such as image retrieval and display to IBM Personal System/2s and Compaq microcomputers, users no longer have to build their own applications.

Users will also benefit because FileNet has developed applications to meet the needs of multiple users and applications; therefore, they have greater functionality than a user-developed program for a specific application. "Generally, vendors include more functionality than a customer or end user would have included if doing it just for their own use," Castle said.

A new component of WorkFlo, dubbed WorkFlo Queue Services, enables customers to use a C programming interface to develop network-based applications, such as routing images from one workstation to another.

Users can also use the C interface to develop programs that take advantage of Microsoft Corp.'s Microsoft Windows' dynamic data exchange capability to exchange information between applications running on a single personal computer.

This allows users to integrate Windows-compatible application programs, such as word processing or spreadsheets, into their imaging environment.

FileNet will continue to market its proprietary workstations because they are multitasking and their scripting language for application development is more user-friendly than C, Castle said.

The WorkFlo Queue Services tool kit and Open WorkFlo Architecture are available now. FileNet declined to disclose pricing.

FileNet Corp. can be reached in writing at 3565 Harbor Blvd., Costa Mesa, Calif. 92626, or by calling (714) 966-3400.

Touch unveils X.400 gateways

continued from page 31

format into X.400 form, Moore explained.

In a typical configuration, the gateway engine will reside on the same Ethernet as the proprietary E-mail package.

Users can purchase a fully configured gateway engine from Touch or load the software onto an existing Unix workstation. The gateway engine software requires 8M bytes of system memory and 100M bytes of available disk space.

Individual LANs supported by the gateway engine are linked together using routers, Moore explained, so that only a single connection is made from multiple LANs to the Unix workstation. He said there is no limit, however, to the number of individual LAN segments that may be linked to the gateway engine.

There are two exceptions to this typical configuration, he added.

With SMTP and UUCP, a gateway component is not required on the LAN but resides exclusively on the gateway engine. Also, cc:Mail's software does not use an E-mail server but simply uses the LAN file server for store-and-forward functions, Moore explained.

The gateway engine also requires an X.25 interface card to route mail messages over packet-switched nets.

The X.400 gateway for MHS will be available in May for $2,000. MHS runs on DOS-based personal computer LANs, predominantly LANs running NetWare. Because Touch is offering an MHS gateway, other products based on MHS, such as Paradox Development Corp.'s Para-Mail, are also supported.

Touch's X.400 Gateway for cc:Mail, which can run on DOS, OS/2 and Apple Computer, Inc. Macintosh-based LANs, will be available in the second quarter for $2,000.

The X.400 Gateway for CE Software's QuickMail, which runs exclusively on AppleTalk LANs, is scheduled for availability in May 1990 for $2,000.

The X.400 Gateway for Microsoft Mail, which uses Macintoshes for servers but supports DOS and Macintosh clients, is available now for $2,000.

Touch's X.400 Gateway for TOPS' InBox Plus, which runs on LANs based on DOS and Macintosh hardware, will be available in June for $2,000.

Similarly, the X.400 Gateway for SMTP and UUCP costs $2,000 and is available now.

The X.400 gateway engine and the X.400 protocol software running on the Unix workstation cost $3,000 and $5,000, respectively.

Touch Communications can be reached by writing to 250 E. Hacienda Ave., Campbell, Calif. 95008, or by calling (408) 374-2500.

3Com introduces adapter, module

continued from page 31

allowing net managers to troubleshoot and isolate problems in a network without affecting other users on the local-area network.

3Com said it will provide free upgrades or replacements if the final 10BaseT specifications are different from the products it's now selling.

The EtherLink/MC TP will be available in April and costs $495. The MultiConnect TP Module will be available in May and is priced at $595.

The company also said a previously released product, the EtherLink II TP, which connects IBM Personal Computers and PS/2 Models 25 and 30 to 10-BaseT networks, will be available in a five-package set of adapters and cost $1,875, or $375 for each board. Bought individually, they sell for $445 each.

Wang agreement

Under the OEM extension, Wang will sell 3Com's EtherLink II TP and the new EtherLink/MC TP for personal computers with MCA. Both products support shielded and unshielded twisted pair.

The extension adds to their partnership in which Wang resells 3Com's Ethernet and token-ring adapters, including EtherLink II, EtherLink Plus, EtherLink/MC and TokenLink.

Gateway lets LANs exchange

continued from page 31

is therefore protocol-dependent. It is not a network-layer router either, because it passes packets transparently without determining available routes before transmitting data.

Although ILAN-H is classified as a gateway, it supports the Spanning Tree Protocol, an Ethernet bridge standard that ensures that packets destined for a failed bridge do not continuously traverse the net, as well as the token-ring source routing protocol, which means the ILAN-H can reside on the same token ring as an IBM source-routing bridge.

ILAN-H will be available May 1 and will cost $7,900 for the basic unit with an Ethernet and a token-ring interface. Ethernet interfaces cost $1,500 and token-ring boards cost $2,000. ILAN users can upgrade their hardware with the new software for $950.

CrossComm can be reached by writing to P.O. Box 699, 133 E. Main St., Marlborough, Mass. 01752, or by calling (508) 481-4060.

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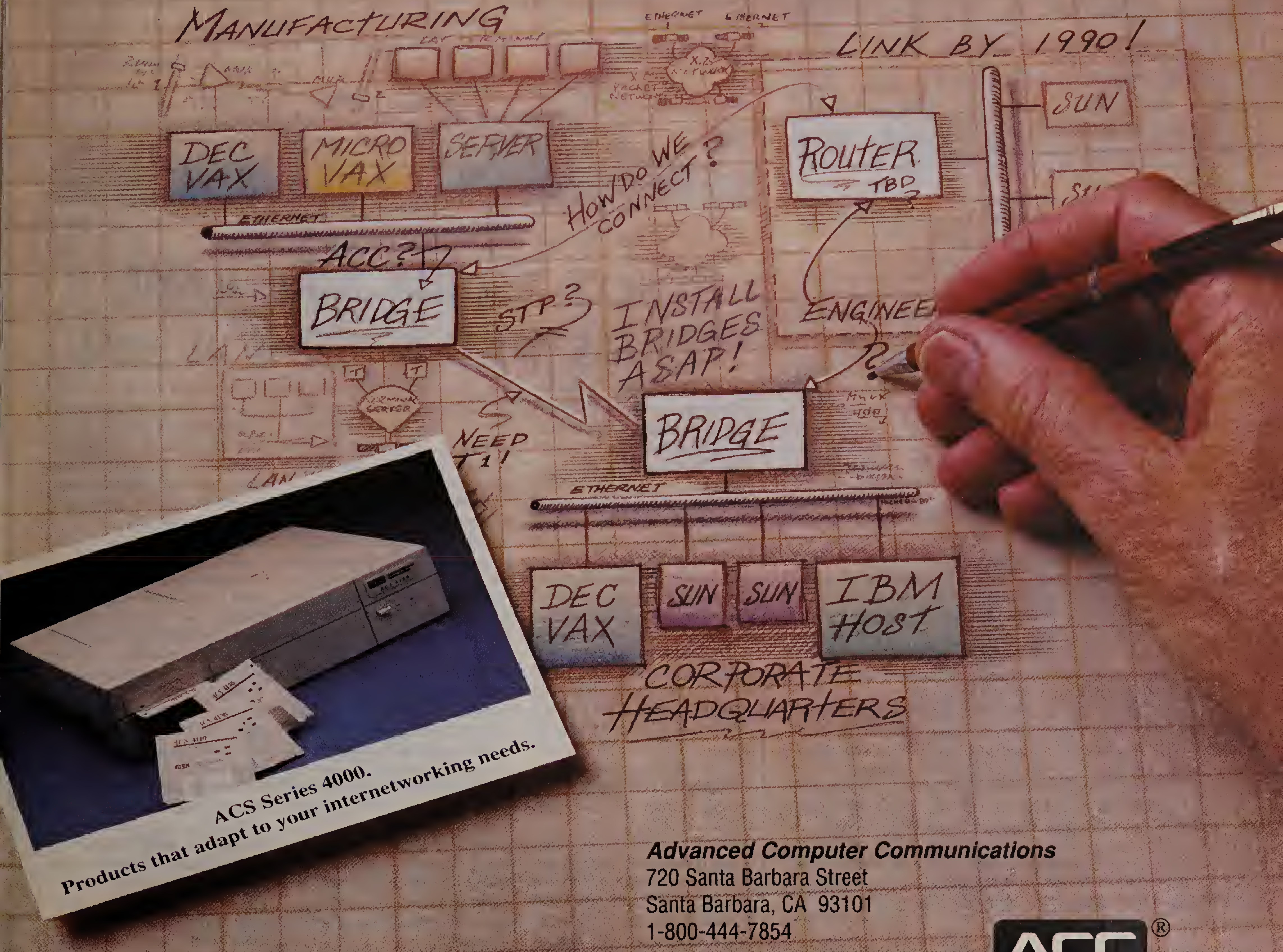

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See the FAXNeT Form on Page #25

OPINIONS

NETWORK MANAGEMENT

BY FRANK PHILLIPS

Introducing a refreshingly simple view

Network managers, like Don Quixote, are on a quest. Their goal is, of course, the all-knowing, "any-to-any," repository-supported network management system. Over the past five years or so, vendors have succeeded in convincing telecommunications users that large, hybrid, corporatewide, voice, data and imaging nets can indeed be managed from a single operator's console in some centralized network control center.

This effort continues today under the fluttering banners of IBM's NetView and AT&T's Unified Network Management Architecture, as well as other acronym-laden titles. These examples of total end-to-end network management may really work, but at what capital and ongoing support costs and at what functional limitations because the network components must all be from a single vendor?

> Total end-to-end network management may really work, but at what support costs?
>
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Eventually, expert systems *will* run our networks. Now, however, the network manager must concentrate on results. To this end, I would like to introduce a somewhat simplified approach to network management based on three concepts:

- Working — the condition where everything in the network is functioning at or beyond the levels anticipated and required to satisfy all network-supported business needs.
- Broken — the opposite of Working.
- Fixed — the process of returning a network element to the condition of Working after it has been Broken.

These three categories will adequately address network conditions at a level needed by those responsible for operating, managing and maintaining a network. These basic terms lack the sophisticated tones found in the rainbow of today's network management systems, but they do accurately describe the three most common states found in today's network environments. Once such terminology is accepted, the obvious question then becomes, "What information is needed, and from what sources, to conclusively determine whether a network element is Working, Broken or Fixed?"

Herein lies the challenge to keep it simple. The first step in this process is to define the scope of the Working category to encompass everything from the lowest acceptable level of service to be tolerated from each network element to the highest level of service to be reasonably expected from each network element.

Next, the network elements forming a specific end-to-end circuit are analyzed to determine the sources that will conclusively indicate Working, Broken or Fixed based on the scope of the Working parameter established above. Once the network elements used to designate the Working category are decided upon, Broken and Fixed conditions are determined primarily as change-of-state conclusions of the same network element information used to determine Working.

This simplified concept of network management is not intended to subvert or supplant the desirable self-healing, artificial intelligence-based systems to come. The concept does, however, accomplish two important objectives: It provides a method to manage hybrid networks *today* at a reduced cost and with increased network management efficiency, and it provides a future alternative for those organizations whose strategic planning does not currently include the funds or the staff to support the network management visions of the future.

Phillips is president of the Hudson Valley Group in Peekskill, N.Y.

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EDITORIAL

Users should take RBHC claims with a grain of salt

Whether or not the RBHCs are really waging a disinformation campaign to win their freedom from line-of-business restrictions, it's hard to swallow their assertion that the U.S. is becoming a second-rate network power.

A report issued two weeks ago by the International Communications Association (ICA) and the Consumer Federation of America attacked the regional Bell holding companies for issuing misleading research and advertising designed to convince lawmakers, regulators and the public that the U.S. is losing its network lead to other nations. An ICA representative said the free-the-Bells campaign has been funded with $21 million of ratepayers' money.

Of course, the RBHCs contested the report's findings and stood by their claims that the U.S. is quickly taking a backseat to other countries in networking. A spokesman for US West, Inc. told *Network World* that American consumers are "beginning to see what they're missing by having seven of the country's most creative and innovative companies sit on the sidelines." He added that any money spent on public relations for this issue is from shareholders, not ratepayers.

But, after considering the issue objectively, how can one agree that the U.S. is losing its network lead?

Despite claims that other nations are investing more in their networks, can anyone dispute that U.S. customers enjoy the widest range of products and services in the world? Where else can customers use virtual network services, switched high-speed data services, T-1, fractional T-1, T-3, central office-based network management services, custom network arrangements and other offerings that, for the most part, are readily available?

Combine this with the wealth of information services and network products currently available from a vast number of suppliers and it's hard to believe that users in the U.S. are hurting because of restrictions on the RBHCs.

It's difficult to see how letting the RBHCs manufacture equipment or provide information services would dramatically affect users, who often complain they're overwhelmed by the choices available to them now.

This isn't to say that line-of-business restraints on the RBHCs shouldn't be dropped. But that decision should be based on an analysis of competition in the local loop, among other considerations.

The money the RBHCs are spending on public relations to paint a bleak picture of the future of U.S. networks would be better spent on upgrading existing facilities or developing new services.

TELECOMMUNICATIONS POLICY

BY ROBERT STEARNS

The NTIA's analytical ability needs improvement

Charged with providing the Bush administration's view on the telecommunications industry through the studies it conducts, the National Telecommunications and Information Administration (NTIA) can offer unique insight into the industry. However, the agency must demonstrate care and responsibility in the projects it undertakes.

Specifically, it should be able to assess the industry through critical analysis based upon varied sources of information. Unfortunately, the NTIA has not displayed the analytical rigor one would expect in an industry as complex as this one.

In its 1987 Trade Report, which NTIA officials still often quote, the NTIA argues that the manufacturing restriction on the regional Bell holding companies is contributing to the U.S. trade deficit.

The conclusion states that lifting the restriction would have "virtually no negative or adverse" trade effects. It does not say that the U.S. trade deficit in telecommunications would be helped by letting the RBHCs into manufacturing, only that it could. Nor does the report offer a cost/benefit analysis.

One would think that the uncertainty of the positive results inherent in the conclusion would warrant a cautious approach to the issue of restrictions, especially in light of the Bell companies' long history of anticompetitive conduct and the potential for injury to independent manufacturers. But in its report, the NTIA says otherwise: "In view of these conclusions, we believe that steps should be taken to liberalize or eliminate" the manufacturing restriction.

With respect to central office switches, the report states that a serious danger to U.S. leadership in the worldwide market exists if the RBHCs manufacture these because of the likelihood that they would establish joint ventures with foreign switch manufacturers. It then goes on to say that special care should be taken if the RBHCs are allowed into this area.

Yet the special care that this serious danger represents is summed up by the following: The threat "could be minimized by adopting joint venture screening procedures, which are less restrictive than the current flat prohibition."

The report does not provide details about the steps that could be taken to minimize the adverse trade repercussions that result from allowing the RBHCs into manufacturing. Nor does it provide proposals for competitive safeguards to prevent unfair competition against U.S. manufacturers that do not engage in joint ventures with the RBHCs.

> Unfortunately, the NTIA has not displayed the analytical rigor one would expect.
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Domestic switch manufacturers such as AT&T and GTE Corp. would suffer if foreign government-subsidized products were allowed into this country. This would reduce America's manufacturing base and, ultimately, the long-run benefits of competition — lower prices and a variety of products and services.

The report's conclusion and recommendation to allow the RBHCs into manufacturing do not follow from its analysis. The report's treatment of this complex subject does not provide an adequate foundation on which to base a major policy change.

A more recent example of the NTIA's lack of conscientiousness can be found in the group's oral address to the Telecommunications Industry Association in November 1989. In it, the NTIA cited a number of product categories and provided market share figures to illustrate how American companies are losing to foreign competition.

The NTIA claimed that in 1987, the U.S. had a 35% share of the worldwide statistical multiplexer market, down from 94% in 1984. Codex Corp., however, estimated that the total share of the world market held by U.S. manufacturers today stands at more than 75%.

While the U.S. market share is indeed lower today, this is due to the competitive marketplace. By no means is the U.S. losing share because of the absence of carrier participation in the market.

It is this type of claim by the NTIA that fuels the fire to free the Bells — to the detriment of users. Unleashing the RBHCs into manufacturing will result in reduced long-term competition because of their ability to cross-subsidize and engage in anticompetitive behavior.

These examples are just symptoms of a problem, not the problem itself. The issue here is NTIA support for the large regulated carriers based on a subjective, uncritical view of the telecommunications industry.

Morever, the real concern is how this view ultimately affects users.

If the NTIA's positions ever materialize in legislation or Federal Communications Commission policy, the growing and healthy level of post-Modified Final Judgment marketplace competition could be damaged. For users, the long-term consequences will be less choice and higher prices for products and services.

The NTIA has an obligation to contribute to the debates now taking place in Washington, D.C., across the country and throughout the world in a meaningful way. To do this, the NTIA must marshal its resources and apply objectivity and responsibility in a more analytical manner in the future.

Stearns is vice-president of corporate marketing at Codex Corp. in Canton, Mass.

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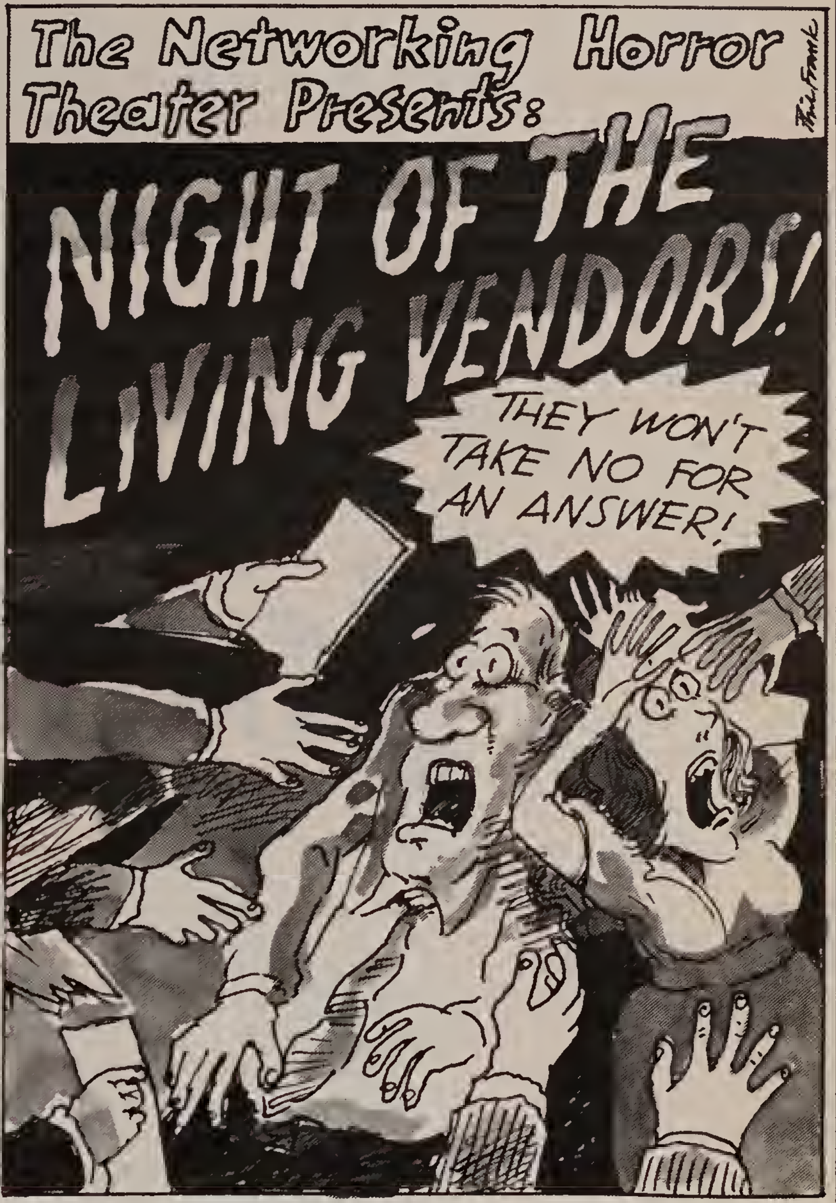
TELETOONS

BY FRANK AND TROISE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LETTERS

Not the last word after all

The recent letter written by David Helfrich of Newbridge Networks, Inc., which is titled "Last word on hybrid nets" (*NW,* March 26), contained several misconceptions concerning the subjects of fast packet and frame relay technologies.

First, contrary to the statements made by Helfrich, fast packet is indeed compatible with the public switched network and most certainly allows users to take advantage of public network services such as disaster recovery, as the thousands of people who use a fast packet network every day will attest.

Second, fast packet — in keeping with all leading-edge technologies — did indeed begin life as a proprietary technology but is now fast approaching standardization as outlined in the CCITT's I.121 recommendation.

Third, frame relay is not a substitute for fast packet, as Helfrich implies. Fast packet technology — also referred to in CCITT I.121 as cell relay or asynchronous transfer mode — can be used for carrying voice, video, data and other digital traffic.

Frame relay, on the other hand, is the first packet mode interface into Integrated Services Digital Network. The CCITT I.121 Frame Relay recommendation that Helfrich mentions in his letter specifies variable delay *data* services only. It does not include any constant delay services such as voice or video.

In our experience, *Network World's* reporters have taken pains to ensure a thorough understanding of their subject, and their solid grasp of the difference between fast packet and frame relay is no exception.

Bill Stensrud
Vice-president of marketing
and strategic planning
StrataCom, Inc.
Campbell, Calif.

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Letters may be edited for space and clarity.

Joining forces

By BRIAN JEFFERY

Ancient civilizations realized the value of cooperation. In a society where materials were scarce, community members learned that by working together, they could gather more food, construct larger buildings and make better use of their resources.

Similarly, large companies are realizing the value of cooperative processing, an approach to computing and communications that allows them to use their hardware resources more efficiently — and save money to boot.

Cooperative processing is generally defined as the concurrent execution of an application as a shared task by multiple processors operating under a single system image.

"Single system image" in this context means that all hardware and software components, whether located on a single processor or distributed among multiple physically separate processors, act as if they form a single logical machine under a single operating system.

Cooperative processing is not a new concept. Since the 1970s, large mainframe systems have consisted of multiple processors that operate under a single system image — in practice, a single copy of the operating system.

Cooperative processing has also been around since the '70s in the form of multiprocessor and cluster architectures. In addition, it has appeared recently in IBM's PC LAN network operating system, and it exists in a highly specialized form in parallel processing architectures. What is new, however, is the idea of extending the single system image approach to multiple physically separate machines. Extending a single system image to disparate devices, such as a mainframe and a workstation, creates a "one-tier architecture," in which both machines, for all intents and purposes, form part of the same system.

However, cooperative processing represents substantially more than a vehicle for microcomputer-to-mainframe links. It is, in fact, a fundamentally different form of computer architecture that merges traditional computer and communications approaches.

Historically, computer architecture has been built around the concept of the CPU and the discrete operating system. The assumption has always been that the computer is a discrete entity. It could be linked to other computers, but in the end, the main unit of architecture was always the single machine.

Cooperative processing starts with the assumption that the basic unit of architecture is the application and various hardware and software components residing on multiple systems should be used to execute the application in

(continued on page 40)

Jeffery is managing director of Los Altos, Calif.-based International Technology Group, an independent information service and consulting organization specializing in analyses of current developments and future trends in worldwide high-technology industries and markets.

Cooperative processing is the key to using communications resources more efficiently and cutting costs.

ILLUSTRATION ©1990 DOUG BOWLES

(continued from page 38)

the most efficient manner, regardless of the machine in which they physically reside. Communications becomes a central component of the system.

In addition, cooperative processing allows for functional specialization of devices.

While conventional approaches to networking have worked on the assumption of links between generally similar systems — for example, mainframe-to-mainframe in Systems Network Architecture or minicomputer-to-minicomputer in DECnet — cooperative processing permits different types of machines to perform specialized functions when executing the same applications.

The focus

The bulk of activity in cooperative processing has, unsurprisingly, focused on the two most functionally specialized systems in the computer marketplace today: mainframes and personal computers.

Personal computers and the new breed of high-end workstations are based on microprocessor technologies that have already, in terms of raw processing power, exceeded any other form of computer architecture developed in the past 40 years.

An Intel Corp. 80486 can run 15 million instructions per second (MIPS), which is about the level of a $2.1 million IBM 3090-170S mainframe.

> Claims that personal computers will take over the world are unfounded.
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The next generation of Reduced Instruction Set Computer CPUs will benchmark at more than 100 MIPS, making them more powerful than any mainframe currently available and putting machines based on them well into the supercomputer bracket.

However, claims that mainframes are dead or that personal computers will take over the world are unfounded. They overlook one of the critical points about personal computers: Not only are they functionally specialized systems, but microprocessor technology is highly specialized in the way it operates.

> Looking closely at the cost/benefit trade-offs of personal computers will yield some interesting information.
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The primary weakness of personal computer technology is that it can't handle large volumes of data — a weakness most end users have yet to experience on any scale. In the U.S., each MIPS of installed personal computer power translates into only around 20M bytes of storage. (The comparable figure for mainframes, interestingly, is more than 3.7G bytes.)

Also, the majority of on-line data used in the typical Fortune 500 organization remains in mainframe and, to a lesser extent, minicomputer data bases. Once personal computers are integrated into corporate information systems on a large scale, users will find they risk major data management problems.

It's also worth pointing out that while personal computers and workstations are highly cost-efficient in terms of cost per MIPS, the picture may change if the calculation is made on the basis of usage.

A mainframe or minicomputer will often be run during multiple shifts at more than 80% capacity, while the typical personal computer or workstation runs only during office hours and often does not approach real capacity for any period during that time. In fact, it is typically used at less than 30% capacity.

This suggests that looking more closely at some of the cost/benefit trade-offs of personal computers will yield some interesting information.

The impact of cooperative processing in this context is potentially enormous and extends well beyond the issue of personal computer/host connectivity. If it were feasible to implement an infrastructure that distributed processing and data management tasks throughout a large organization's entire installed base of equipment on an as-needed basis, the resulting gains in overall efficiency could translate into millions of dollars in savings.

It's useful to calculate the total MIPS or megabytes of all the machines in the corporation and then figure how much of that power is being used at any one time. The results show a startlingly inefficient use of resources.

As a practical example of this, consider the implications of shifting interactive, user-oriented processing from a mainframe to personal computers. Users that have done this have experienced reductions of up to 40% in host loading. This, of course, translates into rather large savings on expensive mainframe hardware.

Interestingly, though, the cost savings aren't all one-way, and the efficiencies don't always favor downsizing.

Another practical example revolves around a user faced with the need to provide more powerful graphics and modeling tools to a large base of end users. Rather than investing in the latest 80386-based personal computer ironmongery, the user found a more cost-effective solution in putting tools on a large system, installing cooperative processing links and then giving everyone a $1,000 Pacific Rim PC-DOS clone.

The end users never saw the difference and did the job just as well. For organizations that face both big-ticket mainframe costs and demands to invest in increasingly sophisticated and expensive personal computers, this approach can yield some major payoffs.

The Cadillac approach

To date, IBM and its Systems Application Architecture (SAA) have tended to dominate the debate about cooperative processing.

More than 60% of SAA's architecture really involves cooperative processing, and most of that revolves around using LU 6.2 to provide a network infrastructure; OS/2 Presentation Manager to provide a workstation-based graphical user interface; and a plethora of software facilities in MVS, VM, VSE, OS/400 and OS/2 Extended Edition to manage the processes whereby systems are brought under a single system image.

This should start becoming clear early next year. In the fine print of IBM's May 1989 OfficeVision announcements was the interesting commitment that Personal System/2-to-host cooperative processing would be implemented in the first half of 1990.

IBM's SAA cooperative processing is best thought of as a "Cadillac" solution.

It uses sophisticated vehicles such as OS/2 Extended Edition and builds an entire SQL relational data base management system architecture into the IBM cooperative processing scenario. In addition, it integrates an OfficeVision local-area network environment and uses an interface — OS/2 Presentation Manager — that is designed to eventually support complex multimedia documents.

At this juncture, a rather important point needs to be made about the IBM scenario. There is a widespread perception that cooperative processing is heavy on processor power and memory; and in the IBM approach, this is certainly the case.

> The Cadillac approach may be the only way to go. But more than a few users will find that the message of greater functionality at greater cost is not a welcome one.
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The overhead, however, is generated by such software vehicles as OS/2 Presentation Manager, IBM SQL and Advanced Program-to-Program Communications, rather than by the cooperative processing link itself.

It is entirely feasible to implement cooperative processing in a much more inexpensive form, using PC-DOS and linking personal computers not only to IBM systems but also to those of other vendors and to Unix systems.

The Cadillac approach may be the only way to go for many organizations. But more than a few end users will probably find that the message of greater functionality at greater cost is not a welcome one.

Cooperative processing already represents the first new technology that cuts corporate expenses to appear in a long time.

Other cooperative processing players

It is not only regrettable but also a little unfair that Systems Application Architecture (SAA) issues have tended to dominate the debate over cooperative processing.

Although IBM's SAA and Personal System/2 strategies involve cooperative processing, Big Blue is not the only game in town. Several third-party suppliers offer products for use in cooperative processing, and more vendors are expected to join them in the future.

> Several suppliers offer products for use in cooperative processing.
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For example, Aspen Research, Inc. in Burlingame, Calif., offers the Mozart personal computer-based host cooperative processing environment; Interactive Images, Inc. of Woburn, Mass., markets a graphical user interface product named Easel that can be used in a cooperative processing mode; and Rochester, Minn.-based Metafile Information Systems, Inc. offers a range of products for cooperative processing built around IBM mainframe, Application System/400 and PS/2 platforms and the company's MetaView language.

In addition, Multi-Soft, Inc. of Lawrenceville, N.J., has one of the longest established and most widely used cooperative processing vehicles, IN-Front; Tangram Systems Corp., in Cary, N.C., offers a product called Arbiter for cooperative processing applications; and a recent startup, San Mateo, Calif.-based Viewpoint Systems, has added a new product, IF/Builder, that supports workstation-to-host cooperative processing.

These vendors collectively represent more than 200 working customer installations of cooperative processing systems in the U.S.

— *Brian Jeffery*

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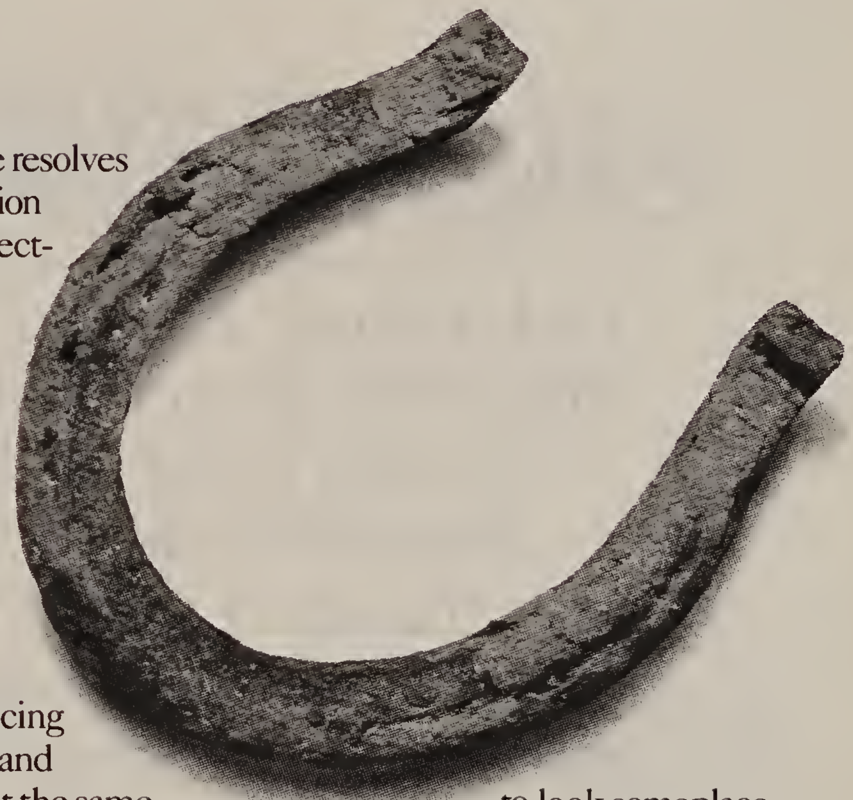

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DATACOM

BUYER'S GUIDE

NETWORK ELEMENT MANAGEMENT SYSTEMS

A table of elements

With network element management systems, users can cut costs and more easily control remote sites.

CONTINUED FROM PAGE 1

The term "network element management system" is difficult to define. Several levels of management systems exist in today's marketplace. At the high end are the enterprise managers, such as IBM's NetView, AT&T's Unified Network Management Architecture and Digital Equipment Corp.'s Enterprise Management Architecture.

Below that is a class of products referred to as domain managers, with the domains generally identified as the local-area network environment, data processing/management information systems environment, private branch exchange/telephony environment and wide-area network environment.

Also, there's a level beneath that, which includes the devices that provide the communications link between locations. These comprise devices such as X.25 switches, statistical multiplexers and modems. Network element management systems fall within these two lower levels.

CHART • GUIDE

A *Network World* Buyer's Guide chart comparing the features of a variety of network element management systems begins on page 47.

As a class, the key feature network element management systems bring to a user is remote control of a network element. Many multisite nets today consist of small, remote sites with little or no technical staff, yet the site still needs to be controlled.

Even at large, central sites, the network control people tend to occupy space that is very expensive. They are either on a raised floor or in a building into which the data center needs to expand. According to Jerry Miller, marketing senior product manager at Bytex Corp., the network control group is the one to which companies seeking extra space say, "Why don't you guys move somewhere else?" Sometimes that "somewhere else" is a building across the street, in which case even the central site becomes a remote site.

(continued on page 46)

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(continued from page 43)

Besides remote control of elements, network element management systems provide other functions to users. First, the systems provide status information about an element. This can range from determining whether the element is operating properly to providing more detailed information about the state of the element, such as whether a remote modem is configured correctly for a particular operation.

This type of information about the state of the element falls into the general category classified as "monitoring." Some type of monitoring capability is essential for other management functions to be invoked. If a problem goes undetected, it cannot be fixed.

This article focuses on network element managers; it doesn't cover products that simply monitor the network. A monitoring device is passive; it simply reports problems without doing anything about them. A network element manager, however, is able to take some type of corrective action to deal with a problem that it detects.

A network element manager is able to take corrective action to deal with a problem that it detects.

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Four additional functions distinguish network element managers from simple monitoring products: some type of diagnostic capability, which allows an operator to determine the nature of the problem; a control function, which lets the network operator take action to restore services; a trouble ticketing component; and resource tracking features, which record information such as the number of nodes on the network, the make and model of the nodal devices, service and warranty information about the devices, and their repair histories.

The network monitoring aspects of an element management system are automated. Generally, the operator inputs into a data base a set of error conditions that constitute unacceptable levels of performance for each network element. As the management system periodically collects information about the status of each element, it compares this information to the preset error levels.

Once a problem is detected, the operator must initiate diagnostic capabilities of the network element management system, which are not automated. Diagnostic tests vary depending on the element. However, this is an area that is getting more attention from network element management vendors.

For instance, Bytex, in conjunction with Tektronix, Inc., offers a line of test equipment that can be controlled remotely. Tektronix test equipment is used in the remote sites; Bytex equipment controls the test equipment from a central site. The system offers the user two choices: It can send the data back to the central site for testing, or it can give control of the remotely located test equipment to the manager at the central site. Either operation is in real time; it is not a store-and-forward operation.

An element management system must offer a control function.

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In the LAN arena, remote diagnostic capabilities are growing in importance. "Network managers need to be able to diagnose various LAN malfunctions down to the port level," says Bill Redman, vice-president and service director of local-area communications with Gartner Group, Inc., a Stamford, Conn.-based market research firm. "As LANs continue to move beyond the desktop toward becoming architected transport solutions, integrated LAN management rapidly becomes a requirement for managing complex multi-LAN systems."

In addition to diagnostics, an element management system must offer a control function, a way for the network operator to restore service by making adjustments to the network. Here, the range of operations varies tremendously from product to product. For example, some products allow only an operator in a central site to disconnect or isolate a faulty component in a remote site.

Other products let the operator restore service by such means as turning on spare equipment at a remote location or rerouting network communications traffic around the malfunctioning device. In addition, some modem management systems allow an incorrectly configured device to be reconfigured from a remote location.

To deal with problems that develop in a remote element that cannot be corrected

(continued on page 48)

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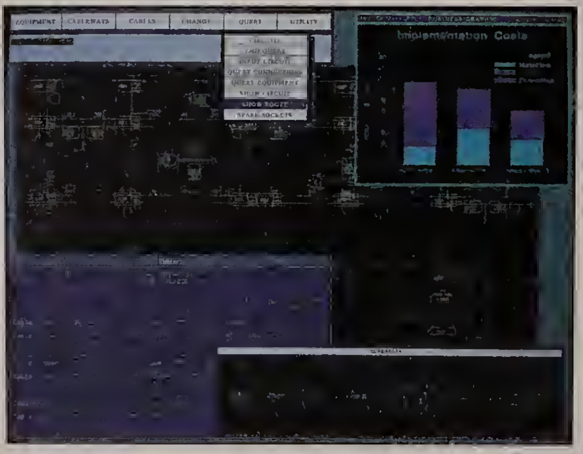

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See the FAXNeT Form on Page #25

NETWORK WORLD

Network element management systems (continued on page 48)

Company	Product	Class of devices supported	Environment supported	Platform	Operating system	User interface	Interface to other programs	Diagnostics	Alerts	Action	Remote reconfiguration	Price
Advanced Computer Communications **Santa Barbara, Calif.** **(805) 963-9431**	ACS 4800 Network Management System	Any device that uses SNMP	Multivendor	Sun Microsystems, Inc. workstation	Unix	Windowing program with icons	No	Polls all devices and links in problem area	Visual and audible notification	Isolate source of failure	Yes	$9,500 for software; $27,420 for hardware and software
AT&T Paradyne **Largo, Fla.** **(813) 530-2000**	Comsphere 6800	Data communications equipment	Multivendor	Workstation	Unix	High-resolution color graphics display	Accumaster	Diagnostic software runs from central site	Programmable alert-driven routines	Fault isolation, automated trouble ticketing, automated trouble reporting places call to vendor	Yes	From $49,400 to support 2,000 devices; $144,900 to support 10,000 devices
Avant-Garde Computing, A Boole & Babbage Co. **Mt. Laurel, N.J.** **(609) 778-7000**	NET/Command 2.1	IBM host and non-IBM SNA devices	Multivendor	Sun workstation	Unix	Displays multiple maps of networks, color maps	Gateways to IBM NetView and Accumaster	Comes with diagnostic capabilities	Alert filtering, prioritizing and routing; active alerts displayed in pop-up mode	Alerts can be categorized and routed to a particular operator	No	From less than $50,000
Bytex Corp. **Southborough, Mass.** **(508) 480-0840**	Unity Management System	Matrix switches	Multivendor	IBM PS/2	Xenix	Windows and multitasking	Host interface to IBM's NetView	Remote testing capability	Error condition checking	Remote testing and restoration	Yes	$5,900 for software
Cabletron Systems, Inc. **Rochester, N.H.** **(603) 332-9400**	LANView	Network hub and bridges	Multivendor	PC	DOS	Microsoft Corp.'s Microsoft Windows	Hewlett-Packard Co.'s OpenView	Network analyzer	Color-coded display, user-set alarm limits	Rerouting of data paths	Yes	$4,995 for software
Clear Communications Corp. **Lincolnshire, Ill.** **(708) 317-2500**	Clearview Surveillance System	CSUs	Proprietary	Sun 386i workstation	Unix	Multiple windows, point-and-click	No	Monitors extended superframe format and superframe format circuits	Displays outages in real time	Gives early warning to allow preventive action	Yes	$31,500 for software to monitor 15 T-1 links
Codex Corp. **Canton, Mass.** **(617) 364-2000**	Codex 9800 Integrated Network Management System	Modems, multiplexers, CSU/DSUs	Multivendor	9850 workstation (a 32-bit workstation with a 68030 processor)	Aegis	Menu-driven, multiple windows, icon-based grapical views	NetView	Data base reporting, interface with PC, generates trouble tickets	Color-coded icons depict severity of event	Network restoral capabilities	Yes	From $75,000
Data Switch Corp. **Shelton, Conn.** **(203) 926-1801**	TotalNet Integrated Management and Control	Switches, PBXs, modems	Multivendor	68030 processor and PS/2 Model 50	Unix	Multiple windows	NetView, Net/Master	Can predefine probable cause using alerts, data base	Color-coded customized displays	Issues trouble-tickets	Yes	$50,000
Digital Link Corp. **Sunnyvale, Calif.** **(408) 745-6200**	Extended Network Management System	CSU/DSUs	Proprietary	PC (386-based)	Unix	Multiple menus, X Window graphics	Portable to other net management systems	Runs test from central site	Maintains data base of alarm conditions	Performance monitoring, error report	Yes	$17,600 for up to 10 T-1 links
Fujitsu America, Inc. **San Jose, Calif.** **(408) 432-1300**	FMS 1000	Modems	Proprietary	PC	DOS	Microsoft Windows	FMSView sends info to NetView PC	Several tests included	Summary screen indicates alarm state	Allows user-defined thresholds for alarms	Yes	$7,995
Halley Systems, Inc. **San Jose, Calif.** **(408) 432-2600**	ConnectView Ethernet Brouter Manager	Brouters	Proprietary	PC/AT	DOS	Icon-based graphical interface; Microsoft Windows	NA	Trend analysis pinpoints problems	NA	Accumulates traffic statistics; allows filtering of activity log	Yes	$2,495
Larse Corp. **Santa Clara, Calif.** **(408) 988-6600**	Integra-T	CSUs	Proprietary	Sun workstation	Unix	Topological displays of net	NetView	Remote diagnostics feature	Alarm indicators displayed on screen	Problem isolation	Yes	$13,000 for software
NEC America, Inc. **Data and Video Communications Systems Division** **San Jose, Calif.** **(408) 433-1250**	Network Control and Management System/ Personal Computer 386	NEC SNMP modems, DSU/CSUs	Mixed; some proprietary, some multivendor	PC	Xenix	Menu-driven, high-resolution color graphics	Optional interface to NetView	Interactive diagnostics	Color used to highlight major vs. minor problems	Problem isolation and tracking, restoral, trouble ticketing	Yes	$3,295 for Intelligent Chassis Management System software
Network Management Inc. **Fairfax, Va.** **(703) 359-9450**	LANware	LAN elements	Multivendor	PC	DOS	Real-time graphical display of net performance	Compatible with NetWare	Yes	NA	Updates programs that control workstations, drivers, and other equipment	Software program performs net configuration	$795 for LANtrack program
PCI/Telematics **Calabasas, Calif.** **(818) 880-4900**	SmartView	PAD, switch, switching PAD	Proprietary	PC AT	Xenix	Menu/data entry window display	No	Report generating for billing and net statistics	Two types of alarm/event files	Disables asynchronous ports, brings down line	Yes	$3,700
Racal-Milgo **Sunrise, Fla.** **(305) 846-1601**	Communications Management Series 6000	Modems, DSUs, multiplexers, switches	Multivendor	Sun workstation	Unix	Color graphics, view entire net or zoom in	NetView, Accumaster	Management module filters alarms	Color-coded on terminal screen	Automatically issues trouble ticket	No	$41,000 for basic system; $90,000 for fully configured system
Sync Research, Inc. **Tustin, Calif.** **(714) 669-8020**	SyncView	Network Access Controllers (multiprotocol X.25 PAD)	Proprietary	PC AT	Unix	Pop-up windows, Informix data base	AT&T Accumaster	Memory dump feature	Alarm collection and logging	Access levels changed to control overused connections	Yes	From $27,000
Telebit Corp. **Sunnyvale, Calif.** **(408) 734-4333**	TMS 10	Modems	Multivendor	PC	DOS	Graphical display of modem racks; menu-driven	NA	Analog, digital and line loop-back tests	Color-coded display of alarm level	Fault isolation	Yes	$1,995

CSU = Channel service unit
DSU = Data service unit
NA = Information not available
SNMP = Simple Network Management Protocol

This chart includes a representative selection of vendors in the network element management systems market. Most vendors offer other network element management systems products, and some vendors not included in the chart may offer a full range of competitive products. Questions about chart listings should be directed to the individual vendors.

SOURCE: *NETWORK WORLD*

NETWORK WORLD

Network element management systems (continued from page 47)

Company	Product	Class of devices supported	Environment supported	Platform	Operating system	User interface	Interface to other programs	Diagnostics	Alerts	Action	Remote reconfiguration	Price
TelWatch, Inc. Boulder, Colo. (303) 440-4756	NetExec	Voice and data nets	Multivendor	Workstation	Unix	Graphical display of net	Accumaster, NetView	Events reported and filtered	Visually displayed on net maps; alerts recorded in data base	Fault management system; issues trouble ticket	Yes	Starts at $50,000
Timeplex, Inc. Woodcliff, N.J. (201) 391-1111	Time/View 2000	Link Integrated Connectivity System (ICS) Nets	Any Link ICS product	Sun 386i micro-computer	Unix	Multiple windows, dialogue boxes, mouse-driven	NA	Audit trail and report generation	Centralized alarm monitoring	User-defined automatic event handling; can download alternate net configurations	Yes	Starts at $29,000
TSB International, Inc. Toronto, Ontario (416) 622-7010	HubView/PC	PBX	Multivendor	PC	OS/2	NA	NetView/PC	Automated data collection routine polls net	Collects alarms and alerts for viewing through NetView	Alarms classified, critical alarms passed to NetView	Yes	$10,500 for complete software package

CSU = Channel service unit
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This chart includes a representative selection of vendors in the network element management systems market. Most vendors offer other network element management systems products, and some vendors not included in the chart may offer a full range of competitive products. Questions about chart listings should be directed to the individual vendors.

SOURCE: *NETWORK WORLD*

(continued from page 46)

from a central location, network element management systems have a problem reporting feature. Most systems issue a trouble ticket for the device. Some automatically call the element manufacturer's service department to report a defective piece of equipment and request service.

System-level integration

AT&T, IBM, Hewlett-Packard Co., Cincom Systems, Inc. and DEC are fighting for dominance of system-level network management. Each company offers its own version of an enterprise network management system.

Since most nets have more than one element, a network element management system will have to communicate its information to one of the big five to be effective. This is an area where standards — particularly Open Systems Interconnection-based standards — would seem to be the best route. However, as is the case in many areas of networking, standards seem to be mentioned more in the future tense than the present tense.

The drive toward standards in network management is not coming from vendors or even from U.S. users, according to Dan Lynch, president of Interop, Inc. in Mountain View, Calif. Instead, the impetus is being supplied by European customers.

To date, OSI network management has been addressed at the lower three levels and the seventh layer of the OSI model. For the first three layers, the common network management protocols agreed to, though not formally endorsed by any governing body, are the CCITT X.25 WAN standard and the IEEE 802.3 LAN standard. The Common Management Information Services (CMIS) and Common Management Information Protocol (CMIP) are most commonly used for the exchange of network management messages in the seventh layer of the OSI system.

Since OSI is not yet fully implemented, interfaces between the higher level management systems and the network element management systems are done on a 1-to-1 basis, usually with some alliance between the element management company and one of the top five vendor firms.

Sam Stavro, vice-president and general manager of operations at PCI/Telematics in Calabasas, Calif., says, “NetView's OSI is coming, but in reality, you have networks made up of components from different manufacturers. What you need today is something to manage a multivendor environment. People are using network element management systems as surrogates to the upper-level management systems.

> The drive toward standards in net management is not coming from vendors or even from U.S. users, but from European customers.

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“In the old days — two years ago — it used to be OK for an element management system to manage just one vendor's technology or that vendor's group of technologies,” says Steve Mank, director of network management marketing for Codex Corp. “That's no longer any good. You have to be able to share the information these devices gather with some other management system, and it must be done in real time. That's where standards become critical.”

The better and more standardized the interfaces between element management systems and enterprise management systems, the easier it is for the user to connect and control multiple element systems. “Most folks only want to do things once,” Mank says. “It's not a cheap effort for the user to integrate different management systems.”

While users certainly will benefit from standards-based integration of element management systems, vendors are also interested, but for a different reason. “Vendors do not have the resources to develop something that is unique to DEC, to IBM, to AT&T. That's a lot of overhead to carry to do the same thing,” Mank says.

Network managers know they cannot take everything they do today and manage it on one console. But they are getting to the point where they have a network composed of some combination of the four major domains — LAN, DP/MIS, PBX/telephony and WAN — and they need to know how each element affects the other components in the system. Again, this is an area where standards are important.

Users need to know the interplay of the various components in the network. If there's a fault in one area, what other areas are affected? Users need to be able to exchange information among management systems to see the connections. For example, Case Western Reserve University in Cleveland, Ohio, uses Cabletron Systems, Inc.'s Remote Lanview management software and a local traffic statistics program on each adapter card to identify network traffic problems.

“The management system allows us to respond quickly to problems that could affect more than one user,” says Dell Klingensmith, director of the university's Information Network Service. “We can accurately pinpoint potential bottlenecks from our network information center.”

Trends: in their elements

Element management systems focus on network performance. Because of their ability to concentrate on a small part of the network, however, the systems have other applications. Two related areas in which element management systems could be put to good use are network planning and charging for network services.

Companies use their networks to deliver services to their own users. Network element management systems can tell network managers how well their networks are delivering these services. A company can see if it has spent its money in the right places by monitoring elements. A capability that is most useful in this area is the ability to play “what if” with the management systems.

Since network element management systems give so much detailed information about a particular segment of the network, companies can use the systems to see if they have made the right choice for a given application. According to Codex's Mank, customers are asking for tools to evaluate these types of tradeoffs.

Companies are looking for more administrative management (vs. operational management) types of functions. This includes inventory management — the ability to ask questions such as, What do I have? and How many do I have? It also includes asset management — How much did I pay for it?, Do I lease it? and What type of maintenance and service contract do I have on it?

Other areas that are growing in importance are billing and accounting functions. Companies are beginning to view the network more as an asset, and now they want to bill people for use of that asset. This type of billing is desired by network service suppliers and for intercompany billing to another department, for example. The network element management systems allow network managers to bill users only for what they use on that network.

The trend seems to be that network element management systems will evolve away from the fascination with diagnostics to more administrative roles.

On the device side, the move is away from building hardware to more software-based environments. As one network manager who asked not to be named says, “We are constantly tinkering with the boxes. In an ideal world, you'd install a box and never touch it again. You would use the management system to provide for new revisions to products and devices.”

Network element management systems are used to provide detailed information in a convenient format to the right person in an organization. The main change in the field involves the definition of who “the right person” is.

In the past, the information gathered by network element management systems would be used by technical staff members to keep the network up and running. Today, the network element management systems collect administrative information about the network. This allows more people in an organization, including management and administrative personnel, to take an active role in managing the network.

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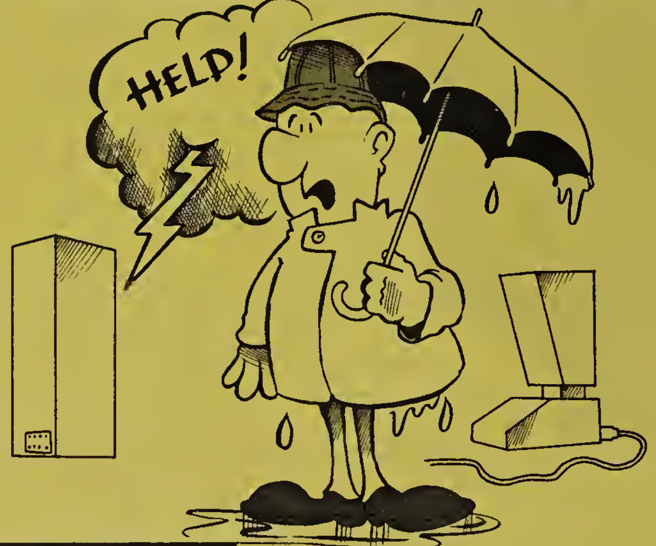

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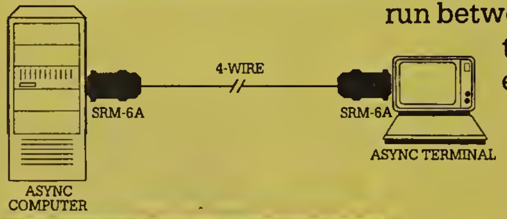

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The SRM-6 family has sync and async modems for 4-wire or 2-wire full duplex, operating at data rates up to 19.2 kbps in point-to-point or multipoint environments. They are easy to install, and operate without AC power.

From the growing Rad family.

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data communications ltd.

U.S. Headquarters
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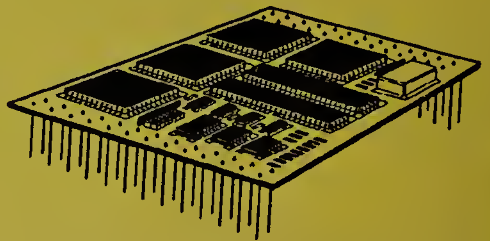
Circle Reader Service No. 19

NETVIEW-NET/MASTER NETWORK MANAGEMENT

We've Got the Guts ...
... You Get the GLORY!

NETVIEW LPDA CHIP SET ...

NetView device-level management is now available in a revolutionary new single chip set. The power of advanced LPDA modem or DSU/CSU diagnostic control functions is provided in one OEM module. NetQuest's C-100 VLSI chip set offers easy integration into any transmission device. It is compact (4" x 2.75") and low in cost, yet high in reliability and performance.



... MAKES MODEMS NETVIEW COMPATIBLE

- NetView (Net/Master) management functions for analog or digital, leased or dial-up transmission products.
- Line speeds from 50 bps to 72 Kbps. Requires only 5V DC.
- Easily added to diagnostic or non-diagnostic modems and DSU's, Hayes AT (V.25 bis) compatible modems, switched DSU's and similar products.
- No software and minimal hardware engineering effort required for target modem. May be customized to fit specific space requirements.
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- May be controlled over a standard microprocessor bus as an intelligent communication peripheral.

NetQuest's C-100 is all that you need to compete in the NetView modem arena, and become compatible with the industry's most popular network management system. Act now ... competitive modems require competitive network management.

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Larus

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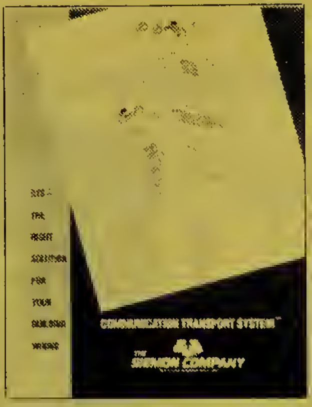
Free from the
Siemon Company
The CTS
Design Workbook



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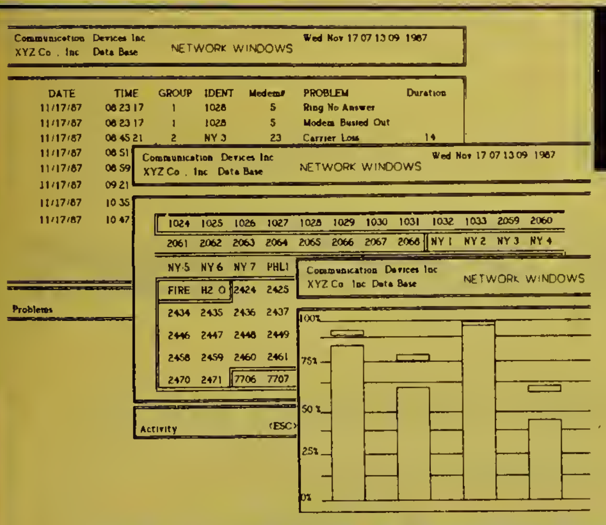

```
Communication  Devices Inc                          Wed Nov 17 07 13 09 1987
XYZ Co . Inc   Data Base      NETWORK WINDOWS

  DATE       TIME      GROUP  IDENT   Modem#   PROBLEM            Duration
11/17/87   08 23 17     1     1028      5      Ring No Answer
11/17/87   08 23 17     1     1028      5      Modem Busied Out
11/17/87   08 45 21     2     NY 3     23      Carrier Loss          14
11/17/87   08 51
11/17/87   08 59
11/17/87   09 21
11/17/87   10 35
11/17/87   10 47

Problems
```

```
Communication  Devices Inc                          Wed Nov 17 07 13 09 1987
XYZ Co . Inc   Data Base      NETWORK WINDOWS

1024  1025  1026  1027  1028  1029  1030  1031  1032  1033  2059  2060
2061  2062  2063  2064  2065  2066  2067  2068  NY 1  NY 2  NY 3  NY 4
NY 5  NY 6  NY 7  PHL1
FIRE  H2 O  2424  2425
2434  2435  2436  2437
2446  2447  2448  2449
2458  2459  2460  2461
2470  2471  7706  7707

Activity                 <ESC>
```

```
Communication  Devices Inc
XYZ Co  Inc  Data Base        NETWORK WINDOWS
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Any Speed
Any Type, Including **V.32**

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Field Proven since 1983

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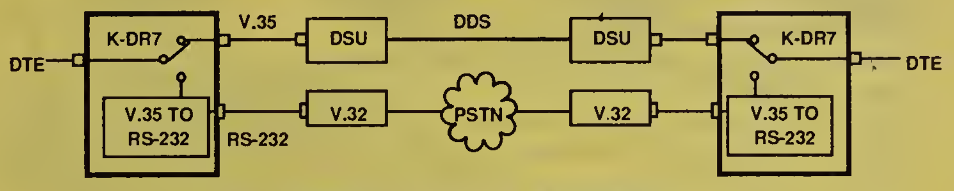

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K-AB-V35	V.35 Version for High Speed Circuits.
K-DR7	Back-up 56KBS DDS with V.32 Modems.
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34 35 36 37 38 39 40 41
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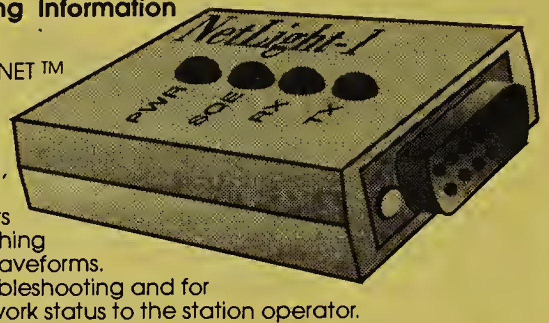
NW Apr 90

ETHERNET LINE MONITOR

NetLight-1

ETHERNET ™ / IEEE 802.3 Attachment Unit Interface Line Monitor

- Provides On-Line Network Status Indication
- Provides Valuable Troubleshooting Information
- Easy to Install



NetLight-1 is a line monitor for the ETHERNET ™ or IEEE802.3 Attachment Unit Interface.
It is available in two versions.
Version A provides LED's that indicate when a station is transmitting, receiving, or experiencing a Signal Quality Error.
Version B provides these same indicators and also provides connectors for attaching an oscilloscope to monitor the signal waveforms.
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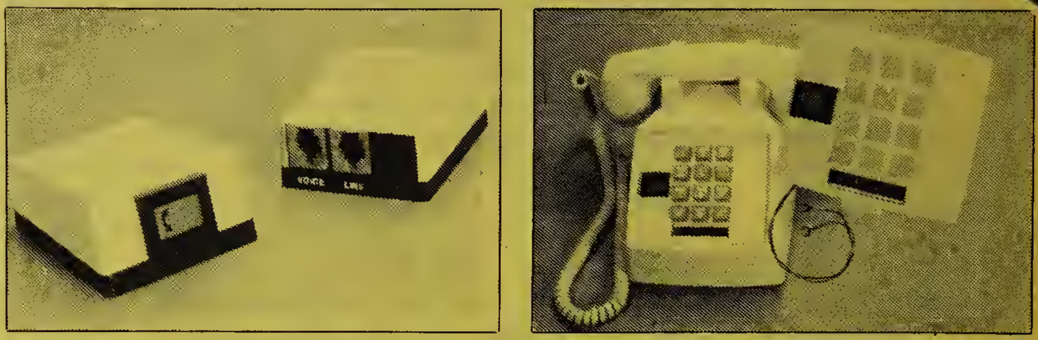

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- Very simple to operate

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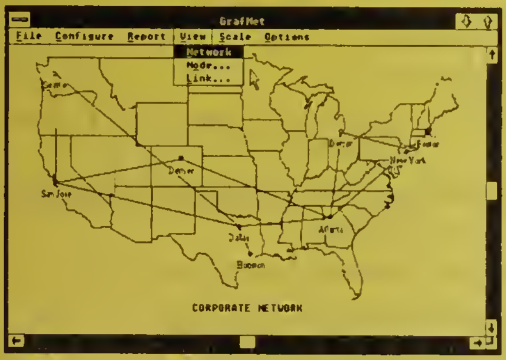

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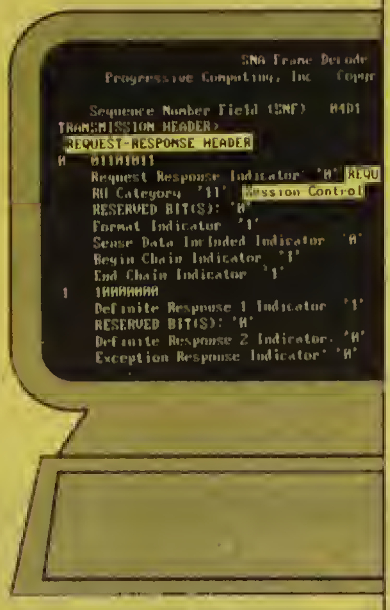
A PC-based protocol analyzer that speaks your language. Plain English!



```
                    SNA Frame Decode
  Progressive Computing, Inc    Copyr

  Sequence Number Field (SNF)   0401
TRANSMISSION HEADER>
 REQUEST-RESPONSE HEADER
0   01101011
    Request Response Indicator' '0' REQU
    RU Category  '11'  Session Control
    RESERVED BIT(S): '0'
    Format Indicator  '1'
    Sense Data Included Indicator  '0'
    Begin Chain Indicator  '1'
    End Chain Indicator  '1'
1   10000000
    Definite Response 1 Indicator  '1'
    RESERVED BIT(S): '0'
    Definite Response 2 Indicator. '0'
    Exception Response Indicator' '0'
```

Now you can analyze data and zero in on errors more quickly. The LM1 Protocol Analyzer gives you easy-to-read decodes spelled out in plain English. It uses exact language from the standards for X.25, SNA, QLLC, and Q.931 protocols.

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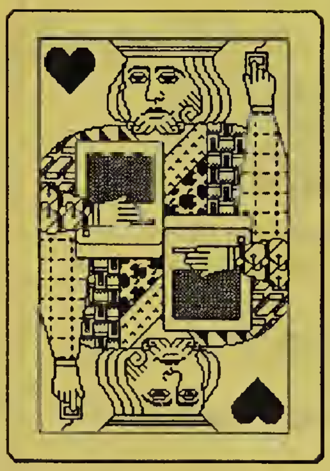

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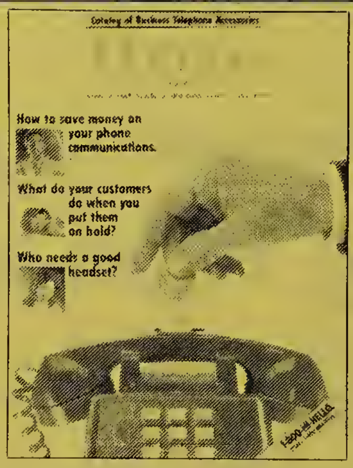
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Nets being called on to boost service

continued from page 1

quality of customer service is their top priority, up from 68% in 1986.

Copier networks

One example is Xerox Corp. of Stamford, Conn. Xerox is betting that a network-based application it calls Remote Interactive Communications (RIC) will help it upstage competitors.

With RIC, copiers monitor their own performance. When they suspect they are in danger of breaking down, the copiers dial into one of four service centers and upload performance data into a host-based artificial intelligence system. AI software on Digital Equipment Corp. host minicomputers determines whether the machine is actually ailing and dispatches repair personnel if needed.

According to Virginia Cornyn, RIC program manager, the network is designed to detect difficulties before customers notice trouble. Xerox began deploying RIC in one of its flagship copier lines last year and introduced a second copier line with RIC last month.

Company surveys show customer satisfaction with RIC-equipped copiers is higher than with regular machines. "This was something we had talked about doing for years," Cornyn said. "But it was only recently that enough critical mass developed on the customer service issue for us to go ahead and do it."

Competitive threat

Fear of being outflanked in customer service is one of the factors driving New York Life Insurance Co. to embark on a five-year mission to overhaul its networks and information systems (IS), said Michael McLaughlin, senior vice-president for policyholder services and IS at the firm.

The effort, dubbed the Individual Operations Support Plan, is examining ways to integrate automatic number identification (ANI) with customer data bases.

"Right now, if a customer calls in and asks to change his policy or inquires about a claim, his request is written down on a piece of paper and handed to someone else, who then looks it up on the computer system," McLaughlin said. "It can take up to two weeks to get back to the customer."

McLaughlin said New York Life wants to use ANI to call up customer data on attendant computer screens when customers call in. This will enable attendants to answer customer questions and make policy changes immediately.

He added that, to his knowledge, no other insurance firm has deployed the capabilities but that several companies are considering doing so. "We're in a situation where if we don't have this, we could be at a competitive disadvantage," McLaughlin said.

Healthy returns

St. John's Regional Medical Center in Joplin, Mo., has already put its two local rivals at a disadvantage as a result of its efforts to use networking to improve customer service.

By establishing network links in mid-1987 between local physicians' offices and the hospital's central IS, St. John's reversed a trend of declining market share at the expense of its rivals, according to Rick Cowan, assistant vice-president for MIS at the hospital.

> "We wouldn't have been the benefactor of this kind of a turnaround unless we were providing an improved level of service through networking," said St. John's Rick Cowan.
>
> ▲▲▲

"We wouldn't have been the benefactor of this kind of a turnaround unless we were providing an improved level of service through networking," he said.

Starting in 1987, St. John's became a value-added IBM dealer and helped area physicians set up personal computers and local-area networks at their offices. The hospital then helped physicians network their systems to its data center to access patient-related financial and clinical data, as well as general medical information, Cowan said.

Cutting billing cycles

The data helps physicians process patient information forms and cut billing cycles by an average of seven days, thus giving doctors more incentive to refer patients to St. John's.

With competing health care institutions following suit, St. John's is moving to bolster its links with physicians by supporting cooperative processing via IBM's LU 6.2 application-to-application protocol, he said.

Initially, this project is giving physicians access to laboratory data and enabling them to track a patient's test results over a period of time.

"By using our networks to improve customer service, we have differentiated ourselves in many ways," Cowan said. "Our competitors are being forced to play catch-up." ◘

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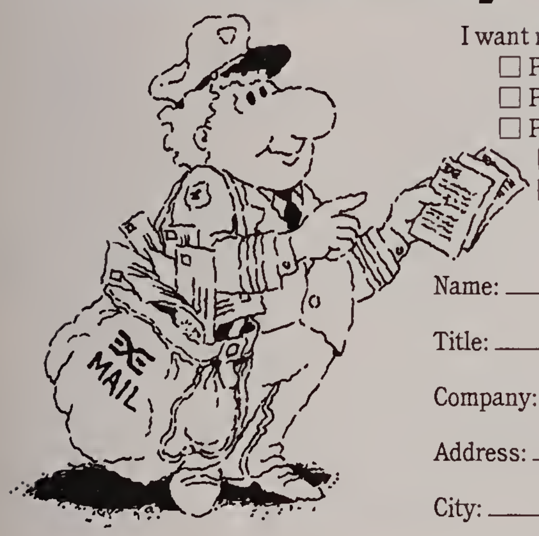

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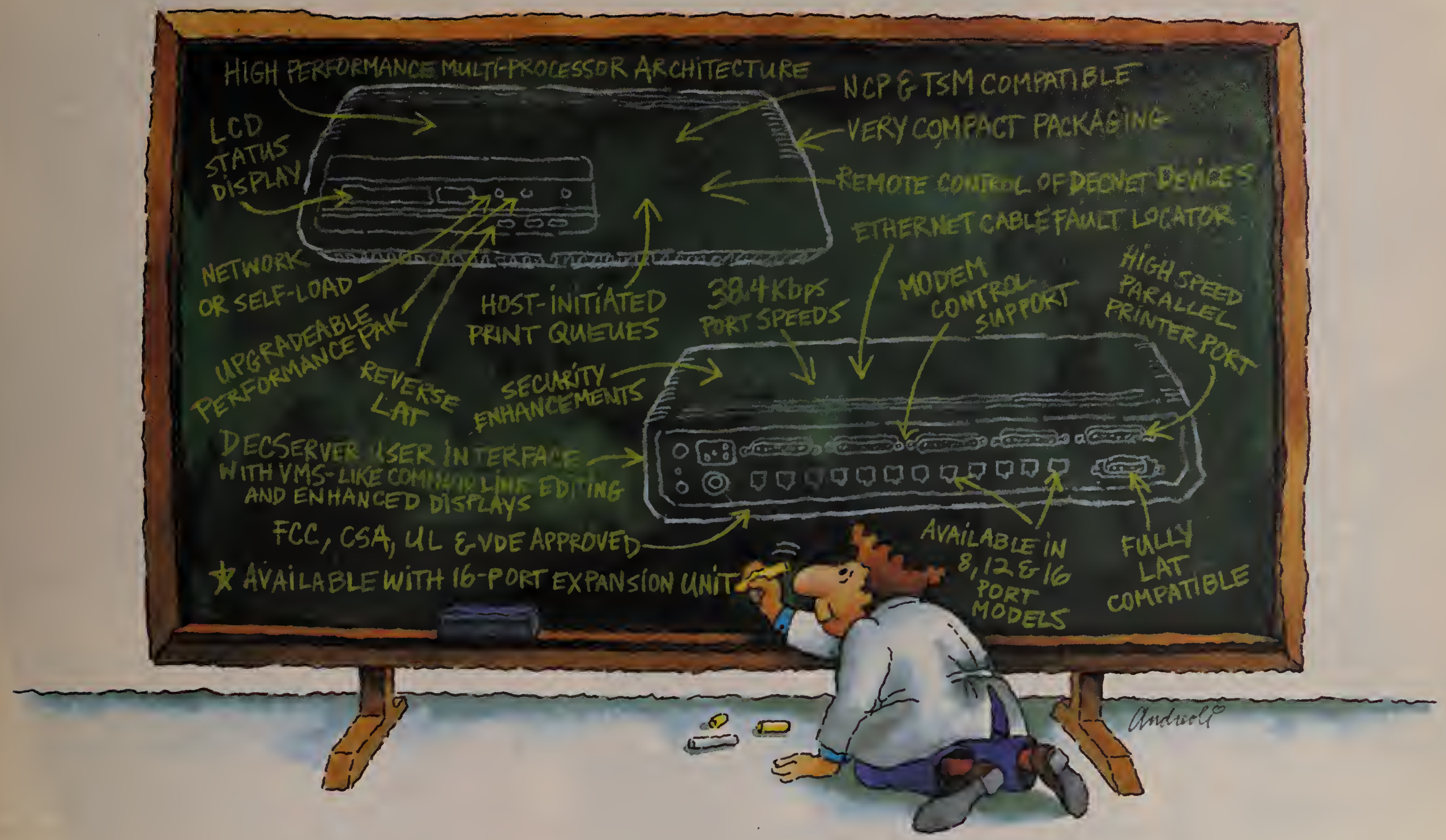
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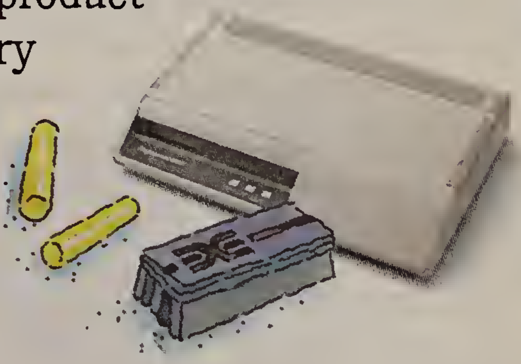

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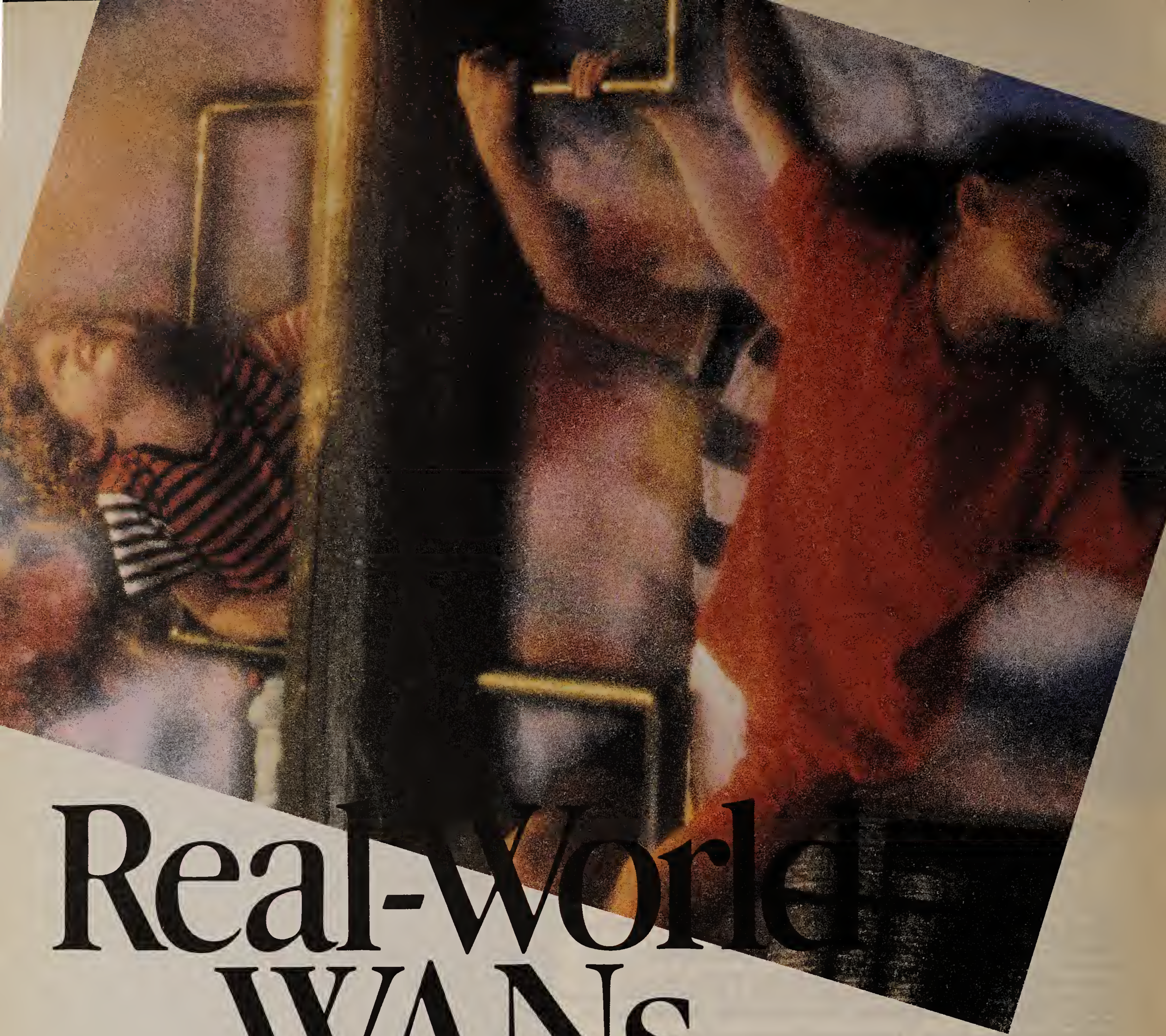

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Task force mulls plans for routing

continued from page 2

Intermediate System-to-Intermediate System has not yet reached the draft standard stage.

One of the two protocols will be used to replace the current Routing Information Protocol (RIP), a network-layer protocol supported by most router vendors today. RIP is used to maintain and update routing tables and relay updated routing information in case of a link failure.

RIP routing decisions, however, are simply based on the number of hops required between end points; the fewer the hops, the better. It does not take into account transport link speeds.

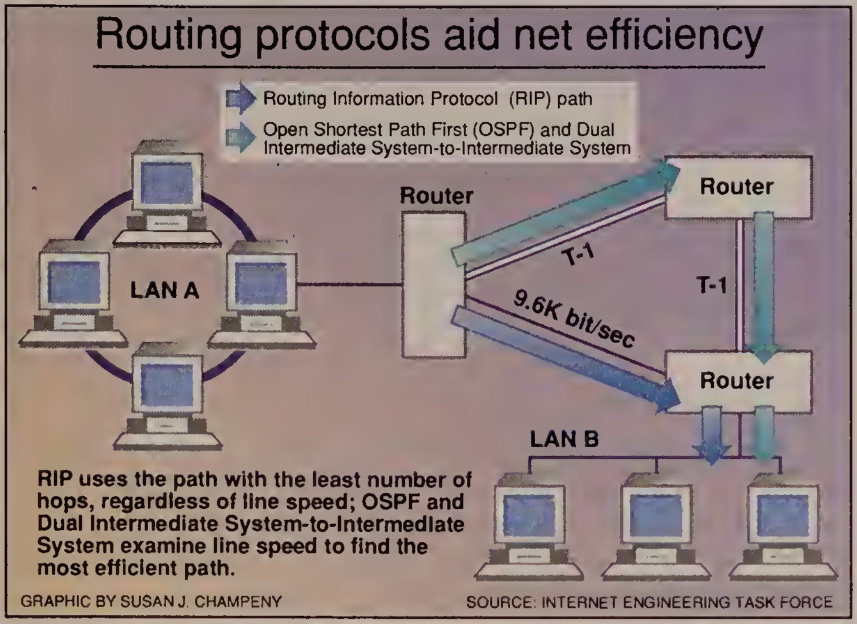
OSPF and Dual Intermediate System-to-Intermediate System are designed to overcome this and other RIP limitations. With these two protocols, data is sent over the path that will allow it to reach its destination fastest, even if that involves more hops.

There is no practical limit to the number of interconnected networks OSPF and Dual Intermediate System-to-Intermediate System can support, whereas RIP can only accommodate up to 16 hops between routers.

The principal distinction between Dual Intermediate System-to-Intermediate System and OSPF is that the former was developed specifically to support OSI and was later extended to support TCP/IP, while OSPF was designed exclusively for TCP/IP.

"From the onset, OSPF was intended to be short-term, for IP only," according to Bill Mitchell, DECnet/OSI wide-area network marketing manager for DEC. "Dual routing is intended to be more of a long-term solution because there will be very few pure OSI or TCP/IP routing environments in the future."

Routing protocols aid net efficiency


Routing Information Protocol (RIP) path
Open Shortest Path First (OSPF) and Dual Intermediate System-to-Intermediate System
Router
Router
Router
LAN A
LAN B
T-1
T-1
9.6K bit/sec

RIP uses the path with the least number of hops, regardless of line speed; OSPF and Dual Intermediate System-to-Intermediate System examine line speed to find the most efficient path.

GRAPHIC BY SUSAN J. CHAMPENEY

SOURCE: INTERNET ENGINEERING TASK FORCE

But according to John Moy, senior staff engineer at Proteon, Inc., cochairman of the IETF's OSPF working group and author of the OSPF specification, the protocol meets the needs of the large installed base of TCP/IP users better because it was designed for them from the ground up. "When you can design a routing protocol for a specific application, you can make it much more efficient, rather than trying to shoehorn it into the TCP/IP world," Moy said.

In fact, he maintains that the Dual Intermediate System-to-Intermediate System could be a hindrance to OSI migration, rather than a facilitator. Because Dual Intermediate System-to-Intermediate System melds OSI and TCP/IP, it will be difficult to introduce either protocol alone, Moy said. The OSPF working group "is all in favor of OSI migration; we just think it's easier when you have completely separate stacks."

Mitchell, on the other hand, argued that Dual Intermediate System-to-Intermediate System will smooth the transition from TCP/IP to OSI and that OSPF's migration to OSI would require the router to support two protocols, straining the device's CPU.

Although running two routing protocols on a router increases demand on its CPU, Moy said the CPU cycles consumed by a routing protocol are minimal compared with the amount required for data traffic.

Last week, cisco Systems, Inc., Proteon, 3Com Corp., Vitalink Communications Corp. and Wellfleet Communications, Inc. announced support for OSPF and, with the exception of 3Com, said they would support Dual Intermediate System-to-Intermediate System if it becomes standard.

Met Life to use CallPath for edge

continued from page 6

CallPath was designed primarily to help telemarketers, customer service centers and order entry centers process calls faster by forwarding calls, along with data concerning the caller, to agents.

In Metropolitan Life's CallPath beta test here, which was begun last December and concluded late February, CallPath was used to support 18 customer service agents handling calls concerning personal insurance policies.

In the subsequent production environment, as in the beta test, policyholders dial in on an 800 number to reach Metropolitan Life's IBM 9751 CBX, which is configured as an automatic call distributor and is running the CallPath 9751 software.

A recorded announcement asks callers to key in their policy number, which the PBX passes to the host.

The mainframe searches for the appropriate customer data file and sends it to an agent workstation as the switch passes the call to the agent. The 9751 passes calls from callers with rotary phones directly to agents.

The company said the beta test was slightly rougher than other beta tests it has conducted in the past because IBM CICS specialists had to work with PBX gurus from Rolm, an IBM and Siemens AG company. "There were some procedural problems between IBM and Rolm. They had to figure out who was on first and what was on second," Hoffman said. "It was tough for them to bridge and serve us in a single-point-of-contact fashion."

Even within Metropolitan Life, there was some learning to do. Data communications, voice communications and software programmers had to work as a single unit for the first time, Hoffman said. "Anytime you are forming new relationships between different groups that haven't worked together, you have communications difficulties you have to iron out," she added.

Nonetheless, Metropolitan Life is pleased with CallPath.

"IBM and Rolm have brought together the best functionality of their PBXs and mainframes at the desktop to assist agents in performing daily business functions," Hoffman said. "It's a powerful combination."

Hoffman said the biggest benefit of CallPath is the ability for frontline agents to transfer calls and customer profiles to more experienced agents or supervisors when customers require extra assistance. Frontline agents typically handle only simple transactions such as policy address changes. Roughly 30% of all incoming calls require extra assistance, according to Hoffman.

In the past, an agent who needed help had to motion over a senior agent or supervisor to have them give direction by looking over their shoulder, she said. "Today, with CallPath, the first agent can simultaneously transfer the call and the data screen to the senior agent or supervisor," Hoffman said.

"The beauty of CallPath is that customers don't have to give their policy number, name and address again and again," she said. "That information is already up on the screen. Customers don't get the feeling they are being passed around and around and that nobody knows what's going on."

Ex-Drexel IS employees bitter

continued from page 5

that fall off the tree, and the tree doesn't care."

Forman said the glut of IS personnel is discouraging companies from using employment agencies because they think they can find employees without paying agencies' finders fees. That hurts lower level IS personnel who generally don't have senior-level contacts at other firms.

"There are a lot of people still really hurting," Forman said.

Frank Eckstein, a network communications manager/senior analyst, is one of the few network professionals still working at Drexel. Eckstein is working three 12-hour shifts per week and spending the rest of his time looking for another job.

Eckstein, who works with three other people in a department that used to employ nearly 20, said he was caught off-guard by Drexel's bankruptcy filing.

"I was heartbroken when I heard we were folding," he said. "We were planning to send people to school and expand our net. Then all of a sudden they pulled the rug out from under our feet."

Kam Safhi, a former assistant vice-president for telecommunications at Drexel, landed a job right away as an internal telecommunications consultant at an investment bank but is finding the transition somewhat painful. Safhi is trying to deal with the shift from being a supervisor with a staff of five to working alone.

Tom Kane considers himself one of the lucky ones. Kane, a former assistant vice-president/project manager for telecommunications at Drexel, moved to a similar position with another large brokerage firm on Wall Street.

"I was bitter at first," Kane said, "I had been there for seven-plus years, and up until the last couple of years, when we were under the gun, it was a very enjoyable atmosphere.

"I realized that even though things didn't work out and the company's gone, it doesn't mean I didn't do anything worthwhile there," he said.

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Users should centralize

continued from page 2

site assistance or indirect support through help desks, training sessions and other options.

"By putting PCs and LANs all over the place, things have gotten a little bit out of control, and most companies are trying to reel things back in," said Chuck McCaig, senior vice-president of corporate services at Mutual Benefit Life Insurance Co. in Newark, N.J.

McCaig said end users at his company have inadvertently erased information from their systems' hard disks that represented thousands of hours of work. Since the data was not backed up, users had no way to recover the lost information.

Mutual Benefit Life also ran into trouble when several programs developed by end users had bugs that no one knew about. The programs were being used to generate corporate sales data and keep track of employees who qualified for bonuses.

"For a long time, we were running the business on numbers that were wrong," McCaig said. "When you get burned enough times, you realize you have to start managing users more closely."

The bottom line, McCaig said, is that companies have to reassert control over standards and procedures for using systems. This may mean that a senior IS executive has to approve all systems purchases to ensure they fit into the corporate information architecture, as well as define and enforce procedures for such things as backing up file servers and updating software.

"The paradox most companies are learning is that the more you distribute systems, the more you need to centralize certain things like controls and procedures," McCaig said.

Rick Segal, technical advisor for Aetna Casualty and Surety Co. in Hartford, Conn., emphasizes the importance of establishing clear guidelines and support structures before letting users assume responsibility for maintaining a local-area network that runs mission-critical applications. This would include setting procedures for backing up file servers, establishing help desks and setting standards for updating and debugging software.

Segal is so adamant about the need for companies to establish guidelines that he has helped form a new users group, the Council for Network Management, that will help LAN administrators identify operational requirements for managing network resources.

> "All of the things we do in the mainframe world must be downsized to the local network environment," Segal said.
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"All of the things we do in the mainframe world must be downsized to the local network environment," Segal said. "With distributed systems, users are more intimately involved in systems disasters than they would be in centralized environments. This forces you to take a very hard look at the infrastructure you put in place to support the end-user community."

But more than clear guidelines are needed if users don't have the time or expertise to maintain and protect distributed systems, according to Robert Patrick, an independent consultant in Rosamond, Calif., and author of the *Application Design Handbook for Distributed Systems.* The best way for companies to safeguard user systems is to let central IS provide the necessary support, he said.

End users should work with an administrator from the company's central IS shop to implement systems and upgrade and modify software, among other things.

Patrick said companies should not overlook the advantages of centralized processing in their rush to distribute computer resources to users. Centralized processing provides greater economies of scale and cost savings, fewer headaches for end users and a larger organization in which IS professionals can advance, he said.

"The best advice I can give is don't decentralize unless you know what you're doing," Patrick said.

Trust vs. control

IS managers reared in centralized environments often pose the biggest obstacle to the success of distributed systems, according to Landen Bain, administrator of IS at The Ohio State University Hospitals in Columbus.

Bain said distributed processing requires IS executives to embrace a new management style based on trust rather than a need to control end-user behavior.

"In a distributed architecture, [IS managers] need a certain amount of trust that end users will manage departmental systems properly so they don't have to flat-out control what users are doing. But many [IS managers] are unwilling to release control, especially if they're used to a centralized environment," he said.

Bain said the primary role of IS executives must be to build a network "utility" based on open standards that provides corporatewide connectivity while giving users freedom to choose whatever systems best meet their needs.

"An open network enables users to do their own thing but gives them the ability to access other users' data anywhere on the network."

DEC announces RISC servers

continued from page 5

system 5000 Model 200, a desktop server that offers 24 MIPS of performance and greater disk storage than the older DECsystem 3100, which had 14.3 MIPS.

The DECsystem 5000 Model 200 is a general-purpose RISC-based server that can be used as a file server for work groups, a server to off-load tasks from local workstations or a server in a multiuser time-shared environment.

The new high-end RISC servers eclipse the DECsystem 5810 and DECsystem 5820, which offer 18.7 MIPS and 35 MIPS, respectively. DEC said it will continue to market the older models, but it is cutting their prices by almost 40%. Users may also upgrade to the newer models.

The DECsystem 5830 and 5840 are targeted at users in the medical and engineering markets. The new servers are especially suited for graphics-intensive processing, three-dimensional modeling and other compute-intensive applications.

The RISC-based servers can provide services to Apple Computer, Inc. Macintoshes, DEC DECstations and personal computers running DOS or OS/2. They also provide print, file-sharing and electronic mail services to all these nodes on a net.

The heart of the servers' ability to process more information lies in the SMP enhancement to Ultrix, according to Dominic LaCava, vice-president of low-end systems at DEC. SMP increases the performance of a server by allowing two or more processors to share a single resident copy of the operating system and perform tasks concurrently.

DEC also said Ultrix Version 4 has been further enhanced to include, for the first time, a data base engine based on SQL and a remote procedure call (RPC) facility, which is a port of the RPC component of the Network Computing System, manufactured by the Apollo Division of Hewlett-Packard Co.

The SQL engine allows applications running on the server to access and use information from different vendors' SQL data bases across a network.

The RPC facility allows an application to be broken up into subroutines and farmed out to several computers in a multivendor net.

"For DEC users, it's a pretty good announcement because the company demonstrated its commitment to open systems," said Kathleen Hurley, an analyst with Dataquest, Inc., a San Jose, Calif., market research firm.

By broadening its product line, DEC is in a better position to compete with Sun Microsystems, Inc. in the Unix market, she said.

"This is obviously going to affect Sun and help Digital gain market presence," Hurley said. She added, however, that it is unlikely a price war will break out. DEC's fully configured desktop server costs about $33,000, vs. a Sun SPARCserver 330, which would cost about $26,000.

> The heart of the servers' ability to process more information lies in the SMP enhancement to Ultrix.
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Pricing starts at $14,995 for the DECsystem 5000/200, which is available now. The DECsystem 5830 costs $140,000, and the DECsystem 5840 is priced at $160,000. Both will be available in June. Ultrix Version 4 software will be ready early this summer and costs from $801 for a four-user license to $35,234 for a license covering unlimited use.

DEC/Apple pact to bear first fruit

continued from page 1

Macintoshes to access data on DEC systems and communicate with DEC users across a DECnet.

For example, VMS Services for Macintosh will enable Macintoshes to access data in VAX relational data bases, including DEC's Rdb, sources said. It will be sold and supported by DEC.

While DEC and Apple officials declined to elaborate on the announcement, Mike Zivkovic, Apple's strategic marketing manager for the Digital environment, confirmed that VMS Services for Macintosh will be unveiled in New York next month.

"We're very excited about the May announcement. We're providing users with all the plumbing and the basic network services to allow them to integrate their AppleTalk and DECnet networks," Zivkovic said. "VMS Services for Macintosh is a comprehensive product that provides users with the best of the Apple and DEC worlds."

In a recent interview with *Network World,* John Rose, DEC's group manager for its Personal Computing Systems Group, said the product would be in beta test during the spring and would ship sometime this summer.

"Our intent is to provide a rich set of capabilities to enable Macintosh users to integrate their workstations and networks with VAXes," Rose said.

Server within a server

The primary server software provided in VMS Services for Macintosh is AppleTalk for VMS, an implementation of Apple's AppleTalk protocol that enables Macintosh users to store files on a VAX in Apple formats. AppleTalk for VMS also includes a gateway capability that will enable Macintosh users to transparently access data on other AppleTalk and DECnet nets.

Among the other features included in VMS Services for Macintosh are:

- X/Window System capability, which allows a Macintosh user to access X/Window applications residing on a VAX under VMS or Ultrix.
- A DEC terminal-emulation program, which lets Macintoshes mimic DEC VT-100, VT-200 or VT-300 terminals and access applications or data on VAXes.
- Support for DEC's Local Area Transport (LAT) protocol on the Macintosh, which allows Macintoshes to set up direct sessions with VAX hosts, bypassing terminal servers. LAT is DEC's standard terminal communications protocol.
- A VAX-based Macintosh-to-VAX Mail Services interface, which lets Macintosh users exchange VMS Mail or DEC's All-In-1 office mail messages with users on the DECnet network.
- A print-serving capability, which enables Macintosh files to be printed on DEC Postscript printers.

Analysts hailed the imminent introduction of VMS Services for Macintosh, saying it will spur the growth of DEC/Macintosh integration.

"It's about time we see a child born from the Apple/DEC marriage. For high-volume users, this announcement ranks as a seven or eight," said Nick Arnett, an analyst at Creative Strategies Research in Santa Clara, Calif. "The availability of Macintosh/VAX integration products from DEC, which previously have only been available from third parties such as Alisa Systems, Inc., Pacer Software, Inc. and Odesta Corp., legitimizes the market and should open up a lot more users' eyes to the possibilities of mixed networks."

Pricing for VMS Services for Macintosh has not been finalized yet, but sources close to both firms said they expect the Macintosh client software to cost about $300 to $450 per workstation, while the VAX Server license will probably be priced at less than $5,000.

WILL YOUR COMMUNICATION SYSTEM
BE ABLE TO GROW
ALONG WITH YOUR COMPANY?

WILL YOU BE LOCKED OUT OF GLOBAL MARKETS
BECAUSE YOUR NETWORK ISN'T UP TO WORLD STANDARDS?

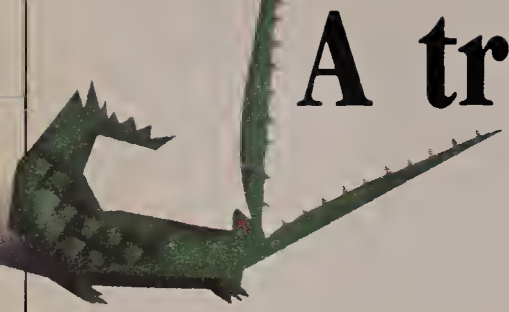
WILL YOU HAVE ENOUGH POWER TO DELIVER ISDN?

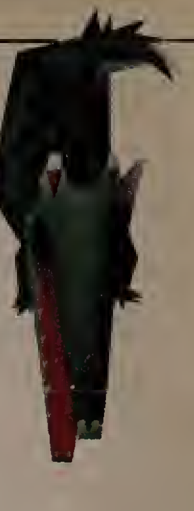
WILL YOU BE READY TO HANDLE VIDEO
WHEN USERS DEMAND IT?

**To know for sure,
you'd need a time machine...**

ALLIGATORS IN THE SWAMP

Unforeseen problems that can put the bite on your network





A treacherous twisted-pair tale

By JIM CAVANAGH

It started out quite simply, as complex things do. Stanley's company, an aerospace manufacturer, was upgrading its minicomputer system through the addition of a local-area network. The Digital Equipment Corp. VAX minicomputer, which was previously connected via multiconductor, low-speed, RS-232 cable to asynchronous terminals, was to be upgraded to accommodate Ethernet. The old terminals would still be supported but now via Ethernet terminal servers rather than RS-232 cabling all the way back to the host.

Additionally, the company was planning to add DOS and Unix file servers and a set of new personal computer-to-VAX services that would provide a reliable, high-speed connection between all server and end-user resources. Users would then be able to send electronic mail messages and share printers and modems; a number of the VAX applications' personal computer counterparts could seamlessly share data as well.

The company's original intent was to link all of these resources via a traditional "thick" Ethernet cabling arrangement. Stanley, who was the data center supervisor, disagreed with this strategy and voiced his opinion during an early planning meeting.

Why use thick Ethernet?

"Why install old, expensive and clumsy thick Ethernet when we can get the same 10M bit/sec data rates over twisted pair?" he asked. Stanley suggested that the company use the existing telephone wires, a telephone patch cable from the wall to the personal computer and network interface cards with modular jacks to create a system that would be easier to use, less expensive and relatively simple to implement. "And it's all possible with technology that's available off the shelf today," Stanley added.

The planning group was very impressed with Stanley's idea. The logic appeared sound, the technology was being used by other divisions of the company, and the financial savings were, in fact, substantial when compared with the cost of traditional thick Ethernet. Additionally, the ability to identify users and match them to a port would provide enhanced network management capabilities. The group discussed the various aspects of Stanley's proposal and decided on the twisted-pair direction.

Over the next few weeks, Stanley assisted in the selection of intelligent twisted-pair hubs that would interconnect all of the users and provide enhanced network management capabilities. A network interface card was selected that would allow direct connection of a modular plug. A special twisted-pair transceiver was selected for the DEC VAX because the Ethernet interface on the VAX would support only a thick AUI or thin BNC connection. Everything seemed ready for installation day.

Stanley arrived at work early on installation day. He counted his face plates once more, inventoried his network interface cards and complimented himself on not being surprised by the physical interface requirements for the VAX. Then he leaned back in his chair and awaited the arrival of his installation team members. Little did Stanley realize that he was catching his last breath before being vaulted headlong into a gut-wrenching roller coaster ride through twisted-pair hell.

The physical installation went almost without a hitch; cards were placed in personal computers, wall plates were installed, and intelligent twisted-pair hubs were brought on-line for the first time. But when the software was loaded and the system as a whole was brought on-line, a number of problems began to rear their ugly heads.

Some of the workstations located close to the hubs actually worked, some transferred data at unacceptably low speeds, and others were unable to communicate at all. In addition, the intelligent hub isolated many lines due to detected incompatibilities.

An additional problem was encountered with the telephone systems. Because the pairs going from the wiring closet to the phone sets were poorly documented, many pairs of conductors were crossed. This caused problems, such as line noise or loss of phone service, with the private branch exchange and station equipment.

Subsequent analysis revealed a number of deficiencies in the existing twisted-pair wiring. A new set of twisted-pair wires had to be installed, new modular face plates had to be ordered, and all implementation schedules based on the network installation had to be delayed. And there was a significant dollar cost associated with the retrofitting effort.

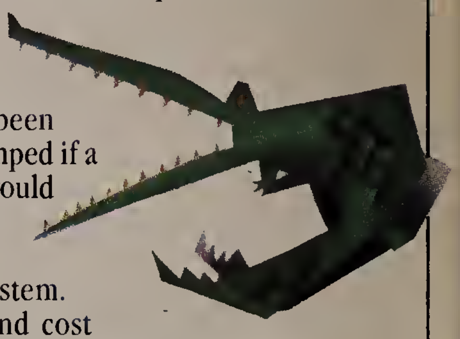
What didn't Stanley know that could have saved his project? What could Stanley have done to find out before formulating his plans?

The first thing that should have been determined was the suitability of the existing wire to effectively carry 10M bit/sec data. Very often, wire will have a product code printed on the insulation that can be checked back with the manufacturer. Lacking a product code and manufacturer, or preferably in addition to a manufacturer's validation, certain important physical characteristics of the wire can be verified. The most critical are the gauge of the wire; the quality and thickness of the insulator, or dielectric; and the number of twists per foot, which affects the capacitance of the wire.

Another important consideration is total length of the drop and the number of intermediate punch-down blocks that may occur between the twisted-pair hub and the Ethernet workstation, file server or host.

The draft 10BaseT standard allows for a total distance of 137 feet if 26 American Wire Gauge (AWG) twisted-pair conductors are used; it allows up to 203 feet if 22 AWG conductors are used. These distances allow for three intermediate punch-down blocks. If additional punch-down blocks are needed, subtract 60 feet for each. However, no wire bridges are allowed.

The electrical characteristics of the existing wire could have been thoroughly checked in advance with a time domain reflectometer. A sample, maybe 10%, of the installed twisted pair could have been randomly spot-checked as an early part of the planning process. Even a theoretically perfect twisted-pair wire can become unacceptable through improper handling at installation or by relaxation over time in a wall or ceiling.



Once the physical characteristics of the wire had been validated, a second major hurdle could have been jumped if a wire audit of the facility had been conducted. This would allow for a check of the validity of all existing wiring diagrams and documentation to avoid misuse of pairs and disruption of the existing telephone system. Many companies have found that the manpower and cost needed to perform a proper, thorough audit on a large facility justifies the cost of brand-new twisted-pair wiring to support data applications.

These two major items, checking the suitability of the physical twisted-pair media and verifying existing installations, if applicable, will reduce the total number of alligators in your LAN pond and help you achieve success in your twisted-pair installations. ◘

Cavanagh is manager of network integration for Allied Data Communications Group, Inc., a vendor-independent network integrator in Norcross, Ga.

IT'S HARD TO DRAIN THE SWAMP when those reptiles keep getting in the way. If you have a network "alligator story" to share with *Network World* readers, call Steve Moore, features editor, at (508) 820-7439 or fax your idea to (508) 820-3467.

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